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LEPIDOPTERA INDICA.



# LEPIDOPTERA INDICA.

BY

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OF BENGAL.

VOL. V.

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## **RHOPALOCERA.**

### FAMILY NYMPHALIDÆ.

SUB-FAMILY NYMPHALINÆ (*continued*), Groups MELITEINA AND EURYTELINA.  
SUB-FAMILIES ACRÆINÆ, PSEUDERGOLINÆ, CALINAGINÆ, AND LIBYTHEINÆ.

### FAMILY RIODINIDÆ.

SUB-FAMILY NEMEOBINÆ.

### FAMILY PAPILIONIDÆ.

SUB-FAMILIES PARNASSIINÆ, THAIDINÆ, LEPTOCIRCINÆ, AND PAPILIONINÆ.

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# LEPIDOPTERA INDICA.



## Sub-family NYMPHALINÆ (*continued*).

### Group VII. MELITÆINA.

- Lemoniades*, Hübner, Tentamen Lep. p. 1 (1806).  
*Lemoniades* (part), Hübner, Verz. bek. Schmett. p. 26 (1816).  
*Argynmites* (part), Blanchard, Hist. Nat. Inst. ii. p. 331 (1845).  
*Argynnidi* (part), Stephens, Catal. Brit. Lep. B.M. p. 13 (1850). Stainton, Manual Brit. Lep. i. p. 21 (1857).  
*Argynnidæ* (part), Duponchell, Catal. Méth. Lep. Eur. p. 2 (1844). Guénee, Faunæ E. et L. Lep. p. 17 (1867).  
*Argynniides* (part), Kirby, Eur. Butt. p. 21 (1862). Butler, Catal. Fabr. Lep. B.M. p. 100 (1869).  
*Meliteidæ*, Newman, Brit. Butt. p. 39 (1871).  
*Nymphalidæ* (part), Lang, Rhop. Eur. p. 159 (1884).  
*Nymphalinae* (part), de Nicéville, Butt. of India, ii. p. 1 (1886).  
*Nymphalidæ* (*Melitea* group), Staudinger & Schattz, Exot. Schmett. ii. p. 119 (1887).  
*Melitewidi*, Scudder, Butt. U.S. i. p. 618 (1889). Tutt, Brit. Butt. p. 303 (1896).  
*Melitæina*, Moore, Lep. Indica, ii. p. 227 (1895).

### CHARACTERS OF THE GROUP MELITÆINA.

IMAGO.—Small. *Forewings* elongately-triangular; apex obtuse; exterior margin almost even. *Hindwings* short, obovate; exterior margin very slightly scalloped.

LARVA.—Head small, unarmed. Body attenuated a little anteriorly, armed with four longitudinal series of short coarse branched-spines.

PUPA.—“Rather stout. Head obtuse; thorax rounded; abdominal segments with dorsal and lateral small blunt tubercles” (Scudder).

EGG.—“Somewhat acorn-shaped, higher than broad, well rounded at base and at sides, and broadly docked at the summit; with very slight longitudinal ribs occupying only the upper half, the surface below being smooth, or indented with polygonal or rounded depressions” (Scudder).

HABITS, ETC.—The butterflies of this group “are generally single brooded toward the northern limit of their range, or in high altitudes, but double brooded

or polygoneutic elsewhere. The eggs are generally (perhaps always) laid in clusters, and the larvæ, at least in the early half of their life, are social, often constructing common webs, in which some kinds hibernate; for, so far as known, all the species, whether in the New World or the Old, pass the winter as half grown larvæ" (Scudder l.c.).

#### Genus LEMONIAS.

*Lemonias*, Hübner, Tentamen Lep. p. i. (1806). Scudder, Proc. Amer. Acad. A. and Sc. 1875, p. 203. *Melitæa* (part), Auctorum. *Mellicta* (part), Billberg.

Male. *Forewing* narrower and more elongatedly triangular than in typical *Melitæa*, the costa being straight, apex more pointed, exterior margin oblique and even, posterior margin much shorter; cell longer and narrower; first subcostal branch emitted at some distance before end of the cell, second branch at end of the cell, third at about one-third beyond; discocellulars outwardly oblique; middle median branch emitted immediately before lower end of the cell. *Hindwing* narrower than in *Melitæa*; anterior margin with basal lobe abrupt and thence oblique and straight, apex and exterior margin very convex; exterior margin even. Body stout, very hairy; palpi short, second and third joint much stouter than in *Melitæa*, second joint hairy above and beneath; antennæ short, club cylindrically oval. TYPE.—L. Maturna, Linn. (Hübner, Exot. Sch. i. fig. 598-9).

NOTE.—No representative of this genus occurs within our area.

#### Genus MELLICTA.

*Mellicta*, Billberg, Enum. Ins. p. 77 (1820).

*Melitæa* (part), Auctorum.

IMAGO.—Male. Wings shorter than in *Melitæa*. Base of wings very hairy. *Forewing* subtriangular; costa slightly arched, apex very obtuse, exterior margin convex and very slightly oblique; first subcostal branch emitted at one-fourth before end of the cell, second branch at a short distance from beyond the end, third at one-third beyond; cell short, broad; upper discocellular short, middle short and concave, lower slightly concave. *Hindwing* short, ovate; anterior margin almost straight, exterior margin very convex, anal angle rounded; precostal vein much incurved; cell open. *Body* rather stout, hairy; palpi short, hairy above and beneath, third joint short, pointed; antennal club spatulate.

TYPE.—M. *Athalia*, Rott.

**MELICTA BALBITA** (Plate 380, fig. 2, 2a, ♂; 2b, c, ♀).

*Melitæa Balbita*, Moore, Proc. Zool. Soc. Lond. 1874, p. 268, pl. 43, fig. 5, ♂. de Nicéville, Butt. of India, etc., ii. p. 26, pl. 18, fig. 71, ♂ ♀ (1886).

IMAGO.—Male. Upperside bright fulvous; markings prominent; cilia fulvescent-white, alternated with black. Both wings with black veins; the basal area and posterior margins thickly irrorated with black scales, the bases also clothed with fulvous hairs; a broad exterior marginal black band medially traversed by a row of prominent fulvous dentate lunules. *Forewing* also with the costal edge black; a black slender constricted mark across middle of the cell, a broad streak at its end, and a short longitudinally dentate streak below the cell; a transverse inner-discal angular row of spots, the upper three longest and more or less confluent; followed by an outer-discal row of similar spots. *Hindwing* also with a less-defined black patch within the cell, two inner-discal transverse black imperfect sinuous lines, and a less-defined outer-discal line. Underside paler fulvous; cilia pale yellow. *Forewing* with the veins fulvous; costa and exterior margin pale yellow; markings as above but much less defined. *Hindwing* with black veins; a transverse subbasal black-edged pale yellow sinuous band, a small round spot in the cell, a broad medial-discal curved band, and a submarginal continuous row of broad lunules, all black-edged; the discal band being traversed by a slightly-apparent blackish-speckled irregular line, the interspaces between the bands being duller yellow and blotched with bright fulvous; the extreme outer margin and cilia being also yellow.

Female. Upperside dusky fulvous; the basal areas more broadly and denser black scaled; markings similar to male, but broader and transversely confluent; the medial-discal interspace of the forewing somewhat yellow, and the marginal dentate lunules more or less yellow. Underside as in the male, except that the exterior marginal lunules on the forewing, and on the hindwing, the subbasal, discal, and marginal band, as well as the cell-spot, is glossy pale yellow or white; and the interspacing fulvous blotches prominent and partly black-edged. *Body* above blackish, thorax clothed with fulvous hairs; palpi pale fulvous-yellow, tip blackish; legs fulvous, femora beneath pale yellow; antennæ above black, beneath fulvous annulated with white, tip fulvous.

Expanse, ♂  $1\frac{5}{10}$ , ♀  $1\frac{6}{10}$  to  $1\frac{8}{10}$  inches.

HABITAT.—Kashmir; Chumba.

DISTRIBUTION.—The type specimens were taken by the late Capt. R. Bayne Reed, at Sunamurg, N.E. Kashmir, Mr. L. de Nicéville obtained it on the Sanch Pass, Chumba, at the end of May, and at Chunpur, and on the Murbul Pass, Kashmir, in the middle of June" (Butt. Ind. ii. 20). Major H. B. Hellard found it

at "Baltul in the Sind Valley, Lower Borzil Valley, and Gurais, in Kashmir, in July" (MS. Notes). It is also recorded as having been taken "in the Wakhan Valley, about 12,000 feet elevation. And also on the ascent to the Tragbal Pass, about 9000 feet elevation" (Rept. on the Pamir Comm. 1898, 42).

**MELICTA SINDURA** (Plate 380, fig. 3, 3a, ♂).

*Melitæa Sindura*, Moore, Proc. Zool. Soc. Lond. 1865, p. 496, pl. 30, fig. 2. de Nicéville, Butt. of India, etc., ii. p. 25 (1886). Romanoff, Mem. Lep. v. p. 79, pl. 4, fig. 6 (1889).

*Melitæa Amænula*, Felder, Reise Nov. Lep. ii. p. 392 (1867).

IMAGO.—Male. Upperside fulvous; cilia fulvescent-white, alternated with black. Both wings with black veins; basal areas blackish speckled; a narrow exterior marginal black band which is traversed by an inner row of more or less well-defined fulvous lunules, and by an outer row of less apparent fulvous-speckled lunules. *Forewing* with the costa blackish speckled; a black slender point from base of the cell, a constricted mark across the middle, and a duplex streak at its end; a slender angular mark below the cell; a transverse inner-discal angular row of small spots, of which the two in the median interspaces are the smallest, or sometimes obsolescent; followed by an outer-discal row of similar spots which are sometimes also more or less obsolescent. *Hindwing* with a slender blackish oval mark at end of the cell, an inner-discal transverse imperfect sinuous line, and two medial-discal obsolescent lines, which latter are more defined posteriorly, and these portions macular in the median and submedian interspace. Underside paler fulvous. *Forewing* with the costa and outer border yellowish; cell and discal markings obscure; middle cell-mark interspaced with brighter fulvous; upper discal spots black; submarginal dentate lunules yellow. *Hindwing* with a transverse subbasal narrow glossy white outwardly black-edged sinuous band, an irregular-shaped spot at end of the cell, a medial-discal somewhat macular curved band, and a submarginal lunular band; the basal inner-discal and the outer-discal transverse interspaces blotched with bright fulvous, the inner-discal bright interspace being outwardly black-edged, and the lower bright blotches of the outer-discal interspace inwardly black-edged. *Body* above blackish, clothed with fulvous hairs, beneath paler; palpi and legs fulvous; antennæ above black, beneath fulvous, annulated with white, tip fulvous.

Female. Upper and underside similar to the male; all the markings being more prominent.

Expanse, ♂  $1\frac{3}{10}$  to  $1\frac{4}{10}$ , ♀  $1\frac{5}{10}$  inch.

HABITAT.—N.W. Himalayas.

DISTRIBUTION.—Capt. A. M. Lang writes, "This is very local. I have seen it



but in one place, on one acre of ground. I may say, on a patch of very stony pasture-land, at 16,000 feet altitude, on the Kongma Pass, above Shipki, in July, leading from Kunawur into the Chinese province of Gughe in Tibet, where the ground is not clear of snow for more than four months in the year. Here one day I saw a great number of these insects flying, an icy-cold wind blowing all the time, so that the insects were blown about, and never more than an inch or so above the ground. No other Lepidoptera near them did I see but a stray *Colias Edusa*, and several *Parnassii* coursing up and down the snow-banks a little higher up" (P. Z. S. 1865, 496). Mr. P. W. Mackinon remarks that specimens are "brought in very rarely by native collectors from the Nilang Pass, Tehrai Gurhwul, 18,000 feet elevation, in July" (Journ. Bombay N. H. Soc. 1898, 368). Mr. J. Hocking took it on the Rhotang Pass (P. Z. S. 1882, 243).

**MELICTA SIKKIMENSIS** (Plate 380, fig. 4, 4a, ♂ ♀).

*Melitæa Sindura*, Var. Elwes, Trans. Ent. Soc. Lond. 1888, p. 336.

*Melitæa orientalis*,\* Elwes, *id.* p. 465, pl. x. fig. 4, 5, ♂ ♀ (1888). de Nicéville, Gazetteer of Sikkim, 1894, p. 132.

IMAGO.—Male. Upperside dusky fulvous; cilia whitish, alternated with black. Both wings with the base densely black scaled; veins black; a broad black exterior marginal band, which is traversed by a medial row of more or less obsolescent fulvous lunules. *Forewing* also with a black obtuse point from near base of the cell, a broad reniform mark slightly centred with fulvous scales across middle of the cell, an angular duplex streak at its end, and a broad angled patch below the cell; an inner-discal angular row of rather large spots, of which the three lower are somewhat dentate; followed by an outer-discal row of similar spots, the latter being somewhat partly continuous and slightly confluent with the outer black band. *Hindwing* also with an inner-discal transverse sinuous row of black small dentate spots partly confluent with the black basal area, and an outer-discal continuous row of larger similar spots partly confluent with the outer black band. Underside pale fulvous. *Forewing* with the costa and outer border yellowish; cell and discal markings obscure; submarginal row of lunules prominent and white. *Hindwing* with a transverse subbasal narrow prominent glossy-white black-edged sinuous band, which touches a similar spot at end of the cell, a medial-discal sinuous band with its inner black-edge less apparent, and a submarginal lunular band; the basal, inner-discal and outer-discal transverse interspaces blotched with bright fulvous;

\* Quite distinct from *Melitæa orientalis*, Menetries, Schrenck's Reisen Amurland, ii. p. 23, pl. 2. fig. 5 (1859).

the inner-discal bright interspace being sinuously black-edged, and the outer-discal interspace traversed by a slight black-speckled lunular line.

Female. Upperside slightly more dusky fulvous than the male; the two black discal rows of spots broader and transversely confluent, the outer marginal band medially traversed by more distinctly-defined lunules, those on the forewing being mostly pale fulvescent-white. Underside similar to the male.

Expanse ♂  $1\frac{4}{10}$ , ♀  $1\frac{4}{10}$  to  $1\frac{6}{10}$  inch.

HABITAT.—Native Sikkim; Chumbi; Tibet.

DISTRIBUTION.—Mr. H. J. Elwes and Mr. Otto Möller obtained specimens of this species from native collectors, taken at high elevations on the Sikkim-Chumbi frontier. Specimens of both sexes, from Yatung, Tibet, taken by Captain E. H. Hobson, are in the British Museum.

CHINA AND JAPAN SPECIES.—*Melicta Niphona* (Mel. *Athalia*, var. *Niphona*, Butler, Cist. Ent. ii., p. 281 (1878). Pryer, Rhop. Nippon, p. 27, pl. 7, fig. 6. Leech, Butt. of China, p. 214, pl. 24, fig. 7, ♀ (1893). *Habitat.* Japan, Corea.—*Melicta Protomeidia* (Mel. *Protomeidia*. Ménétr., Schrenck's Reisen Amurland, ii. Lep. p. 23, pl. 2, fig. 6, 7, ♂ ♀ (1859). Fixen, Rom. Mém. Lep. iii. p. 298, pl. 14, fig. 2 (1887). Leech, Butt. of China, p. 216, pl. 24, fig. 8, ♀ (1893). *Habitat.* Amurland; Corea; C. China.—*Melicta Orientalis* (Mel. *Parthenia*, var. *Orientalis*, Ménétr., Schrenck's Reisen Amurland, ii. Lep. p. 23, pl. 2, fig. 5 (1859). Alpheraky, Rom. Mém. Lep. ix., p. 321, pl. 14, fig. 2 (1897). *Habitat.* Amurland.—*Melicta Jezabel* (Mel. *Jezabel*, Obërthur, Etudes Ent. xi. p. 17, pl. 2, fig. 14 (1886). Leech, Butt. of China, p. 217, pl. 24, fig. 9, ♀. *Habitat.* E. Tibet; W. China.—*Melicta Leechi* (Mel. *Leechi*, Alpheraky, Rom. Mém. Lep. ix. p. 103, pl. 9, fig. 4 (1897). *Habitat.* China.

### Genus MELITÆA.

*Melitæa*, Fabricius, Illiger's Mag. vi. p. 284 (1807).

*Melitæa* (part) Doubleday, Gen. D. Lep. i. p. 177 (1848). de Nicéville, Butt. of India, etc. ii. p. 23 (1886).

*Cinclidia*, Hübner, Verz. bek. Schmett. p. 29 (1816). Scudder, Proc. Amer. Acad. A. et. Sc., 1875, p. 142; Butt, E.U.S. i. p. 667 (1889).

*Melinea*, Sodoffsky, Butt. Mosc. x. p. 80 (1837).

*Melicta* (part), Billberg, Enum. Ins. p. 77 (1820).

IMAGO.—Male. *Forewing* subtriangular; costa very slightly arched from the base, apex obtuse, exterior margin slightly oblique and convex; first subcostal branch emitted at about one-fifth before end of the cell, second branch at one-fifth beyond the cell, third at two-fifths; cell broad; upper discocellular very short, extending in a line from subcostal, middle and lower discocellulars very slightly concave;

middle median branch emitted at some distance before lower end of the cell. *Hindwing* conically ovate; anterior margin almost straight, exterior margin very convex and slightly uneven, anal angle obtuse; cell area short and broad across the middle, open; precostal vein incurved. *Body* stout, moderately hairy; palpi porrect, second joint extending half its length beyond the head, flattened at the sides, clothed with long-fine rigid hairs above and beneath, apical joint elongated, pointed at tip, scaled; antennal club ovally spatulate; eyes naked.

TYPE. *M. Didyma*, *Esper*.

**MELITÆA PERSEA** (Plate 379, figs. 1, 1a, b, c, d, e, ♂, 1f, g, ♀).

*Melitæa Persea*, Kollar, Denksch. Akad. Wien. M. Nat. Cl. i. p. 52 (1850). Butler, Proc. Zool. Soc. Lond. 1886, 362.

*Melitæa Robertsi* (part), de Nicéville, Butt. of India, etc. ii. p. 27 (1886).

IMAGO.—Male and female. Wings of the same shape, and the pattern of markings, as in the European *M. Didyma*. Cilia white, alternated with black. **Male.** Upperside pale fulvous; veins concolorous with the ground-colour; base of wings either without blackish scales, but with the black outline of the basal marks only, visible, or, the basal marks are more or less filled in with blackish scales. *Forewing* also with black slender slightly-angled bars across middle of the cell, two similar bars below the cell, and a more or less oval mark enclosing the discocellulars, which latter sometimes extends to the costa; followed by a transverse medial-discal recurved series of more or less rounded spots, the lowest of which is sometimes narrow and angled outward, the upper four spots being more or less confluent, occasionally these latter spots are of uniform size and partly confluent; a subapical short costal angled streak, and sometimes below it are obscure speckles between the veins; beyond is a submarginal row of dentate spots, which are either of uniform size or decreasing posteriorly; and then a marginal lunulated entire band; a whitish costal interspace slightly apparent between the subapical streak and upper submarginal spot. *Hindwing* also with a black slender bar across middle of the cell, two discocellular bars, the latter sometimes interspaced with black scales and continued to the costa; followed by an inner-discal transverse angulated series of more or less confluent lunules; a medial-discal recurved row of round spots, which latter are sometimes obscure or partly obsolete; a submarginal row of narrow lunules decreasing hindward, and then a marginal lunulated entire band. Underside paler fulvous. *Forewing* with transverse markings as on upperside, but less prominent, the apex and outer marginal interspaces dull white. *Hindwing* with the base and inner margin, a triangular cell spot, transverse discal band, and the outer marginal band dull white, disposed as in *M. Didyma*, their bordering black edge-marks slender, and lunular;

the basal black spots small, the medial-discal transverse marks more or less slender, the latter series being sometimes joined to those inwardly-edging the fulvous outer band; the outer marginal spots somewhat lunate; veins white. *Body* above and palpi fulvous; abdomen slightly banded with black in female; abdomen beneath white; legs pale fulvous; antennæ black above, annulated with white beneath, tip fulvous.

Female. Upperside pale fulvous, with similar black markings as in male. Underside as in male.

EXpanse, ♂  $1\frac{2}{10}$  to  $1\frac{6}{10}$ , ♀  $1\frac{6}{10}$  to  $1\frac{8}{10}$  inch.

HABITAT.—Persia; N.W. India.

DISTRIBUTION.—Major J. W. Yerbury found it at “Campbellpur, a military station about forty miles from Rawal Pindi, at 1200 feet above sea-level, Khairabad side near Attock bridge, in November” 1885 (Proc. Zool. Soc. 1886, 362). Major Yerbury also says that it was “not uncommon round Campbellpur in June 1885, and again in March 1886; the spring brood seemed to be larger, darker coloured, and with the base of the wings invaded with dusky. Common also at Attock and Khairabad” (*id.* 1888, 138). Specimens were also taken by Major Yerbury, at Hurripur in October 1886. Examples of both sexes from Jumrood, taken in September, are in the British Museum. We possess examples, received from Major Yerbury, taken at Campbellpur in March, May and June 1886; Attock in May; and at Hurripur in October. Of our illustrations on Plate 379, figs. 1, 1a, b, c, d, e, f, g, are from males and females taken by Major Yerbury.

**MELITÆA ROBERTSI** (Plate 379, fig. 2, 2a, ♂; 2b, c, ♀).

*Melitæa Robertsi*, Butler, Proc. Zool. Soc. Lond. 1880, p. 406, pl. 39, fig. 2; *id.* 1881, p. 605.

Swinhoe, Trans. Ent. Soc. Lond. 1885, p. 339.

*Melitæa Robertsi* (part), de Nicéville, Butt. of India, ii. p. 27.

*Melitæa Doolysoni*, Grose-Smith, Ann. Nat. Hist. 1887, p. 130.

IMAGO. Male. Upperside bright fulvous; base slightly black speckled; cilia white, alternated with black. *Forewing* with two black slender basal cell-bars, the second being more or less angled, an irregular bar across the middle of cell, and two bars enclosing the discocellulars; two dentate marks below the cell; a transverse discal angulated row of large spots; an obscure subapical costal streak; a submarginal recurved row of more or less decreasing obsolescent smaller spots, the lower three or four being slightly dentate or lunate; followed by a marginal row of well-separated conical spots, and then, an extreme outer marginal slender line. *Hindwing* with obscurely-defined slender black cell-bars, and very obsolescent discal markings, followed by a submarginal curved row of small slender lunules, and

then a marginal row of well-separated conical spots, and an extreme outer marginal line. Underside bright fulvous. *Forewing* with markings, as on upperside, but much less defined; the apex and borders of marginal spots pale yellow. *Hindwing* with basal, discal, and marginal band, and cell spot, disposed as in *M. Persea*, pale yellow; the transverse series of spots and bordering lunules being also similarly disposed.

Female. Upperside paler fulvous, the base being greyish-black scaled. *Forewing* with well-defined black cell-marks, a ringlet-mark below the cell, inner-discal angulated row of spots, subapical streak, and very obscure lower speckled-spots; submarginal recurved row of spots and marginal row of well-separated conical spots; the apical and discal interspaces slightly fulvescent-white. *Hindwing* with slender black basal and cell bars, very obsolescent inner-discal markings; followed by a submarginal row of black lunules, then a marginal row of well-separated conical spots, and marginal line. Underside similar to the male, except that the apex and outer margin of forewing, and the basal, discal, and marginal band of hindwing, are white.

Expanse, ♂  $1\frac{5}{10}$  to  $1\frac{6}{10}$ , ♀  $1\frac{8}{10}$  inch.

HABITAT.—South Afghanistan.

DISTRIBUTION.—The type specimens were obtained, by Major Howland Roberts, at Kokeran, near Kandabar, in 1880, where he found it “rather common on the bare uncultivated wastes, at the foot of the Hills, at end of May and beginning of June. One chrysalis was found, but not the larva; the chrysalis was loose in the middle of a low plant” (Proc. Zool. Soc. 1880, 406). Colonel C. Swinhoe took it at “Chaman, S. Afghanistan, in April and May; fairly common” (Tr. Ent. Soc. 1885, 339). The specimens described as *M. Dodgsoni* by Mr. H. Grose-Smith, which we have examined, were taken by Capt. Dodgson, R.A., at Gwashki, fifty-seven miles S.E. of Quetta, at an elevation of 8600 feet.

**MELITÆA CHITRALENSIS** (Plate 380, fig. 1, 1a, ♂, 1 b, c, ♀).

IMAGO. Male and female. Wings shaped as in *M. Balbita*. Cilia white, alternated with black. Male. Upperside bright fulvous-red; veins externally black lined. *Forewing* with the costal and posterior edge black; basal pointed-marks filled in with black; two black angled-bars across middle of the cell, an oval mark enclosing the discocellulars, its outer side being broadest and reaching to the costa; a ringlet-mark and an angled-bar below the cell; an inner-discal transverse recurved row of large quadrate spots, a very slightly-defined subapical costal speckled-streak, and lower series of obsolescent speckled spots; followed by a submarginal continuous

row of dentate lunules joined at the vein-ends to a marginal band, thus leaving a parallel intervening row of fulvous dentate spots. *Hindwing* with a black basal costal elongated bar, the base of the cell and upper portion of inner margin being broadly black scaled; a black oval mark in middle of cell, an inner-discal transverse angulated series of lunules, of which the lower are broadest and merge into the dark inner border; a parallel medial-discal series of rounded spots, of which the upper is the largest, the next two small, speckled, and very obscure, the others increasing in size, the two lowest slightly merging into those above them; followed by a submarginal narrow lunular band, which is joined at the vein-ends to a broader marginal band, thus leaving a parallel intervening row of fulvous broad lunules. Underside bright fulvous. *Forewing* with slender black basal, cell, discal, and marginal markings as above, but much less defined; the apex and edge of outer margin dull white, the latter traversed by a row of small decreasing black spots; the extreme outer margin edged with a denticulated black line. *Hindwing* with a dull white basal sinuous band, a middle cell spot; a broad transverse discal curved band, and a broad marginal lunular band white, the latter crossed by black veins, each band being borderingly-edged with black lunules; basal band also marked with two transverse series of small black spots, the discal band medially traversed by a row of small black lunate spots, and the marginal band by a row of small narrow spots; the extreme outer marginal edge with a narrow black dentate line. *Body* and palpi above black; palpi beneath clothed with fulvous hairs; abdomen beneath whitish, banded with black and lateral fulvous spots, anal tuft fulvous; legs fulvous; antennæ black, the tip fulvous.

Female. Upperside. *Forewing* dusky fulvous; veins black; the basal interspaces powdered with black scales; black markings similar to male, but broader, there being present also, an outer discal transverse row of black continuous lunules, the interspaces between it and the inner-discal row of spots being pale fulvescent-white; the middle cell-bar and inner discocellular bar enclosing a pale fulvescent-white space, the outer discocellular bar being acutely angled. *Hindwing* bright fulvous-red; the black markings as in male, the interspaces between the lower discal spots speckled with pale fulvous scales, and the anal marginal lunules whitish. Underside bright fulvous. *Forewing* marked as in the male; the costal edge, apex, and outer marginal edge very pale yellow. *Hindwing* marked as in male; the basal, discal, and marginal band being very pale yellow.

Expanses, ♂  $1\frac{6}{10}$ , ♀ 2 inches.

HABITAT.—Chitral, N. of Afghanistan.

Our illustrations of this species on Plate 380 are from a male and female in the collection of Mr. H. Grose-Smith. Specimens of both sexes are in the British Museum, taken in the Shishi Kuh Valley, Chitral, 9000 to 11,000 feet elevation, in

July and August, by Capt. G. H. Colomb, and also from Jhela Drosh, Chitral, taken by Capt. S. W. Harris.

CHINA AND JAPAN SPECIES.—*Melitæa Scotosia* (Mel. *Athalia*, var. *Scotosia*, Butler, Cist. Ent. ii. p. 282 (1878). Pryer, Rhop. Nippon, p. 27, pl. 8, fig. 5 (1888). Leech, Butt. of China, i. p. 214, pl. 24, fig. 10, 11, 12, ♂ ♀ (1893). *Habitat.* Corea; Japan.—*Melitæa Agar*, Oberthür, Etudes Ent. xi. p. 18, pl. 5, fig. 31, 32, ♂ ♀ (1886). Leech, Butt. of China, i. p. 218, pl. 24, fig. 6, ♀ (1893). *Habitat.* W. China.—*Melitæa Bellona*, Leech, Butt. of China, i. p. 219, pl. 24, figs. 1—5, ♂ ♀ (1893). *Habitat.* E. Tibet; W. China.—*Melitæa Yuenty*, Oberthür, Etudes Ent. xi. p. 17, pl. 2, fig. 13 (1886). Leech, l.c. p. 220. *Habitat.* E. Tibet; W. China.

Genus TIMELEA, Lucas, Ann. Soc. Ent. Fr. 1883, p. xxxv. *Timelæa maculata* (Melitæa *maculata*, Bremer and Grey, Schmett. N. China, p. 7, pl. i. fig. 3 (1853). Snellen, Tijds. v. Ent. xxxv. p. 6 (1892). Lucas, l.c. p. 35. Leech, Butt. of China, i. p. 245, pl. 23, fig. 7, ♂ (1893). *Syn.* Arg. *Leopardina*, Lucas, Ann. Soc. Ent. Fr. 1866, p. 221, pl. 3, fig. 3, 36. *Habitat.* W. C. and N. China.—*Timelæa Nana*, Leech, Butt. of China, i. p. 246, pl. 23, fig. 8, ♀ (1893). *Habitat.* W. China.—*Timelæa albescens*, Oberthür, Etudes Ent. 1886, p. 18. Leech, l.c. i. p. 246, pl. 23, fig. 9, ♀ (1893). *Habitat.* E. Tibet; W. China.

### Group VIII. EURYTELINA.

- Lemoniades* (part), Hübner, Verz. bek. Schmett. p. 26 (1816).  
*Biblidæ* (part), Boisduval, Faun. Ent. Madag. p. 53 (1833).  
*Biblitæ* (part), Blanchard, Hist. Nat. Ins. ii. p. 332 (1845).  
*Eurytelidæ* (part), Westwood, Gen. D. Lep. ii. p. 403 (1851).  
*Eurytelina* (part), Herr.-Schæffer, Prod. Syst. Lep. p. 16 (1864).  
*Vanessidæ*, *Argynnidæ* (part), Butler, Catal. Fabr. Butt. B.M. pp. 69; 100 (1869).  
*Eurytelidæ*, Doherty, Journ. As. Soc. Bengal, 1886, p. 109.  
*Biblidæ*, Semper, Reisen Phil. Lep. p. 65 (1887).  
*Nymphalinx* (sect. A) de Nicéville, Butt. of India, ii. p. 4 (1886).  
*Nymphalidæ* (Vanessa Group, part), Staudinger and Schatts, Exot. Schmett. ii. p. 122 (1887).  
*Bybliadæ*, Doherty, Journ. As. Soc. Bengal, 1889, p. 126.  
*Eurytelina*, Moore, Lep. Indica, ii. p. 227 (1895).  
*Eurytelidæ*, Aurivillius, Kongl. Vet. Akad. Handl. 1898, p. 153.

### CHARACTERS OF THE GROUP EURYTELINA.

IMAGO.—Male and female. Of moderate size. *Forewings* mostly short and broad, elongately-triangular, or triangular; *costal vein swollen at the base*; apex abruptly pointed or obtuse; exterior margin either erect, slightly scalloped, and angled outward below the apex, and less so at end of the upper median veinlet, or,

the margin oblique and nearly even. *Hindwings* short, broadly obovate; exterior margin more or less scalloped.

LARVA.—Slender. Head armed with two long branched-spines; body armed with two dorsal and two lateral rows of short branched-spines.

PUPA.—Slender. Wing-cases somewhat dilated and angular; anterior segments and thorax dorsally angular; head piece with two small points in front.

EGG.—“Radiate, small, hard, nearly as high as wide, with radiating lines of erectile bristles” (Doherty).

### Genus BYBLIA.

*Byblia*, Hübner, Verz. bek. Schmett. p. 28 (1816). Moore, Lep. of Ceylon, i. p. 45 (1881). de Nieéville, Butt. of India, ii. p. 13 (1886).

*Hypantia*, Boisduval, Ann. Mus. Hist. Nat. 1833, p. 203; Faun. Madagascar, Lep. p. 55 (1833). Westwood, Gen. D. Lep. ii. p. 410 (1851). Trimen, Rhop. Afr. Austr. p. 212 (1866).

IMAGO.—Wings short. Male. *Forewing* elongately-triangular; costa arched at the base, apex obtuse; exterior margin oblique, slightly convex, waved; posterior margin short; costal vein swollen at the base; first subcostal branch short, emitted near to end of the cell, second immediately above end of the cell, third from two-fifths beyond the end, fourth at two-thirds from the end; cell short; upper discocellular extremely short, middle discocellular rather short, concave, lower discocellular long, waved, slender; radials from the angles; upper median branch from end of the cell, middle branch immediately before the end, lower from opposite first subcostal. *Hindwing* obtusely conical; costal margin long; exterior margin very oblique, convex, scalloped; cell triangular; discocellulars of equal length, upper very obliquely concave, lower extremely slender and obliquely concave; two upper medians from end of the cell. *Body* slender; palpi porrect, pilose beneath, second joint projecting much beyond the head, third joint long and cylindrical, scaly; forelegs very short, of *male* slender and delicate, very slightly and finely hairy; of *female* half longer than in male, slender, destitute of hairs, scaly, tarsus thickened at apex, with three pairs of short spines; antennæ slender, with a well-formed flat club; eyes naked.

LARVA.—Cylindrical, slender; segments armed with two dorsal longitudinal rows of twelve rather long branched-spines, and lateral rows of shorter similar spines; head armed with a longer pair of erect branched-spines.

PUPA.—Suspended. Elongated. Head piece obtusely cleft in front; thorax dorsally oblique in front, and raised to a point behind; waist concave; basal segments dorsally raised; wing-cases somewhat dilated laterally.

TYPE.—*B. Ilithyia*.



## BYBLIA ILITHYIA.

*Papilio Ilithyia*, Drury, Ill. Exot. Ent. ii. p. 29, pl. 17, fig. 1, 2, ♂ (1773). Herbst, Nat. Schmett. ix. p. 195, pl. 258, fig. 5, 6 (1798).

*Byblia Ilithyia*, Hübner, Verz. bek. Schmett. p. 28 (1816). Moore, Lep. of Ceylon, i. p. 45, pl. 23, fig. 3, 3a, ♂ (1881). de Nicéville, Butt. of India, ii. p. 14, pl. 18, fig. 68, ♂ (1886).

*Biblis Ilithyia*, Westwood's Edit. Drury, ii. p. 32, pl. 17, fig. 1, 2 (1837).

*Hypanis Ilithyia*, Butler, Proc. Zool. Soc. 1884, p. 483.

*Papilio Polinice*, Cramer, Pap. Exol. iv. p. 169, pl. 375, fig. G, H, ♀ (1782).

*Hypanis Polinice*, Swinhoe, P.Z.S. 1885, p. 129.

*Papilio Goetzius*, Herbst, Nat. Schmett. ix. p. 193, pl. 258, figs. 1—4 (1798).

*Wet-season brood* (Plate 381, fig. 1, larva; 1a, b, ♂; 1c, d, e, f, g, ♀).

IMAGO.—Male. Upperside bright ferruginous; cilia black alternated with white. *Forewing* with black broad costal border extending to near the apex, and a very slender exterior marginal band, the inflated costal vein sometimes being ferruginous; two black short broad bars across the cell and another at its end, the middle being curved and extended below to the median vein; a transverse discal increasingly broad much angulated black band, its lower inner-portion being curved upward to base of lower median veinlet; a submarginal sinuous broad curved band narrowing anteriorly and obsolescent or entirely absent between the radial and lower subcostal, its outer-edge also extending along the veins to the outer margin and thus enclosing a row of broad spots of the ground colour, of which the four lower are conical and the upper are elongated. *Hindwing* with two basal transverse confluent rows of black rounded spots, a discal row of small separated spots of which the upper two are broadly confluent with the inner series; followed by a submarginal black broad sinuous band, the points of its outer edge extending along the veins to outer margin and thus enclosing a row of conical spots of the ground-colour; across the medial discal area the shade of the black line of the underside is obscurely apparent. Underside. Both wings paler ferruginous. *Forewing* with black markings, as above; the cell and upper discal streaks being edged with bluish-white; before the apex is a row of pale yellowish-white spots, and the narrow black outer margin is traversed by a slender bluish-white line. *Hindwing* crossed by a subbasal and a discal white or pale yellowish-white band, the former being inwardly bordered by a row of black round spots and outwardly by a black sinuous broken line; the discal band also being inwardly bordered by a sinuously-disposed row of black irregular-shaped spots, and outwardly by a slender black wavy line; between the bands is a black slender discocellular streak and a small round spot above it, both being edged with white; beyond is a submarginal narrow black sinuous band enclosing a row of small bluish-white dentate spots placed in obliquely opposed pairs in each interspace; the latter

band is outwardly-bordered by a row of conical white or pale yellowish-white spots, and the veins from the discal band to the outer margin are black lined, those in the discal spaces being slightly edged with white scales; the outer marginal narrow black band enclosing a slender bluish-white lunular line. *Body* above ferruginous with a blackish dorsal line; body beneath whitish; palpi above black, beneath pale ferruginous, the sides being white; forelegs white; middle and hind legs brownish above, whitish beneath; antennæ black.

Female. Upperside paler ferruginous. Both wings with black markings as in the male, but slightly narrowed, and the extreme outer border showing a slightly-defined pale marginal line; but more generally, the forewing has the inner black markings narrower, the lower portion of discal band centred with ferruginous, and the lower portion of the sinuous submarginal band is either absent, or entire—sometimes broadly so—and is inwardly bordered by more or less defined blackish lunules; the outer row of ferruginous spots also occasionally being smaller; and on the hindwing the basal area is much less blackened, being generally almost free from black scales, and the rows of spots are more distinct, the submarginal black band is discally-inwardly-bordered by a well-defined, or prominent, black slender lunular line, which latter generally extends along the veins to the band and thus encloses an inner row of small ferruginous spots. Underside paler than in male, markings similar, those on the forewing being narrower, the discal series interrupted, and the bands on the hindwing very pale yellow.

*Dry-season brood* (Plate 381, fig 1, h, ♀).

*Hypanis simplex*, Butler, Proc. Zool. Soc. Lond. 1883, p. 140, pl. 24, fig. 8, ♀. Swinhoe, P.Z.S. 1883, p. 129.

*Byblia simplex*, de Nicéville, Butt. of India, ii. p. 15 (1886).

Male and female. Upperside as in *wet season* brood. Underside darker coloured. *Forewing*. Ground-colour darker ferruginous, but with similar black markings. *Hindwing*. Ground colour deep ochreous red, the transverse bands either pure white or pale yellowish-white and very prominent; the veins from the discal band to outer margin edged with grey, and the submarginal ordinary white-spotted, inner black band is either narrowed, or the black edging to the spots is obsolescent or quite absent, and these white spots reduced in size or to a lunular line.

Expanse (Wet and Dry), ♂ ♀  $1\frac{5}{10}$  to  $2\frac{2}{10}$  inches.

LARVA.—Cylindrical; slender. Segments armed with two dorsal longitudinal rows of twelve rather long branched-spines, and lateral rows of shorter similar spines; head armed with a longer pair of erect branched-spines. Colour. *First*

*stage* dark brown; *second stage* black, with a dorsal yellowish stripe extending its entire length; *Third and last stages* green; spines black.

PUPA.—Suspended. Elongated. Headpiece obtusely cleft in front; thorax dorsally oblique in front and raised to a point behind, waist concave; basal segments dorsally raised; wing cases somewhat dilated laterally. Colour either green, pale greyish ochreous, or dark purplish-brown with the dorsum pale purplish-grey. (Described from original drawings by the late Sir Walter Elliott).

HABITAT.—E. Africa; Continental and Peninsular India; Ceylon.

DISTRIBUTION (within our area).—We possess examples of the *wet* and *dry season* form from Kutch, Ahmednuggur, Poona, Bombay, and Lanowlie, and of the *wet* form from Kattywar, Assirghur, Kanara, Kurnool, Nilgiris and Madras. Colonel C. Swinhoe records it (as *Polinice*) from Poona, from September to December, Ahmednuggur, June to November, and (as *simplex*), Poona, September to January (P.Z.S. 1885, 129). The type of *simplex* is recorded as having been taken, by Col. Swinhoe, at “Depalpur, North of Mhow, in January, being also common at Assirghur, and Depalpur in September and October” (P.Z.S. 1883, 147). Mr. J. Davidson and E. H. Aitken obtained it at Dhulia in the “Khandeish District, and the Dekkan. We reared the larvæ along with those of *Ergolis Ariadne*, on *Tragia Cannabina* (Euphorbiaceæ). We were able to distinguish them only by the fact that the light dorsal line was continued the whole length of the body in this species, and was comparatively uninterrupted. The pupa was undistinguishable” (Journ. Bombay N.H.S. 1890, 269). “Mr. Blathwayt, of Kanara, had a specimen said to have been taken at Karwar, but we have never met with it in the district” (*id.* 1896, 247). Mr. G. F. Hampson obtained it in the “Nilgiris, at 1000 to 3000 feet elevation, near tanks on the plains” (J. A. S. Beng. 1888, 352). Capt. E. Y. Watson records “a few specimens taken at Kolar, Mysore, in October” (J. Bombay N.H.S. 1890, 4). The late Sir Walter Elliott found and reared the larva in Madras, on *Tragia Cannabina*, in August, 1851 (MS. Notes). In Ceylon, according to the observations of Major N. Manders, it is “common in the low jungles in the north of the Island, in July and December” (J. A. S. Beng. 1899, 195). Of the illustrations on our Plate 381, fig. 1 represents the larvæ and pupæ, copied from Sir W. Elliott’s original drawings; figs. 1a, b, c, d, e, *males*, and fig. 1f, g, *female*, of the *wet* season form; fig. h, being a *dry season female* from Bombay.

#### Genus ERGOLIS.

*Ergolis*, Boisduval, Spéc. Gén. Léop. i. p. 4, fig. 4 (1836). Westwood, Gen. D. Lep. ii. p. 409 (1851). Moore, Lep. of Ceylon, i. p. 43 (1881). Distant, Rhop. Malayana, p. 137 (1882). de Nicéville, Butt. of India, ii. p. 7 (1886). Kirby, Allen’s Nat. Hist. Butt. i. p. 109 (1895).

*Ariadne*, Horsfield, Desc. Catal. Lep. E.I.C., pl. 6, fig 2 (1829). Boisd. Ann. Mus. Hist. Nat. p. 201 (1833); *id.* Faun. Ent. Madag. p. 53 (1833).

IMAGO.—Wings short, broad. Male. *Forewing* subtriangular; costa much arched at the base, apex acute; exterior margin more or less sinuous, angled obliquely-outward below the apex and at end of middle median veinlet; posterior margin long; with a large very prominent triangular patch of shining black scales on the underside, extending from the upper median and partly into the cell to the submedian; cell short, broad; costal vein swollen at its base; first and second subcostal branches short, slender, first emitted at some distance before end of the cell, second from immediately above the end of the cell, third at one-third beyond the cell, fourth at two-thirds beyond; upper discocellular short, outwardly-oblique, middle discocellular concave, lower long, slender, recurved; radials from the angles; two upper median branches from end of the cell, lower from opposite first subcostal. *Hindwing* broad; costal margin short, exterior margin very convex, more or less sinuous; with the subcostal and its two branches on the upperside prominently lined with glossy greyish-white scales; precostal well curved from its base; costal vein wide apart from the subcostal; cell short, broad; first subcostal branch emitted before end of the cell; upper discocellular outwardly-oblique and concave, lower recurved; two upper median branches from end of the cell, lower branch from opposite first subcostal. *Body* moderate; palpi porrect, finely pilose, second joint very long and extending half its length beyond the head, third joint half its length and somewhat cylindrical; forelegs slender; of *male* slightly and finely hairy; of *female* scaly, tarsus scarcely dilated at extremity, the joints terminal, spines short; antennæ with a slender club; eyes naked.

LARVA.—“Cylindrical, slender, segments armed with two dorsal rows of branch-tipt spines and two lateral rows of similar shorter spines; head with a pair of long straight branched-spines.”

PUPA.—“Rigidly attached by the tail, so that if the surface is vertical, it stands out horizontally. Slender. Wing cases somewhat dilated; a dorsal protuberance and two cephalic points” (Davidson and Aitken, J. As. Soc. Beng. 1890, 269).

FOOD PLANTS.—The larva feeds on *Tragia involucrata* and *T. cannabina*, the castor-oil plant, *Ricinus communis*, and *Trophis aspera*.

HABITS OF IMAGO.—“Their flight is short and jerky; they frequent bushes and cultivated spots, and always settle with wings widely expanded. They are generally numerous in individuals wherever they occur. It is a curious fact that two distinct species always seem to occur together in India; where one species is met with there will be found another species also” (de Nicéville, Butt. Ind. ii. 8).

**ERGOLIS ARIADNE** (Plate 382, fig. 1, 1a, *larva* and *pupa*, 1b, c, d, e, f, g, ♂ ♀).

- Papilio Ariadne*, Johanssen, Amœn, Acad. vi. p. 407 (1764). Linn. Syst. Nat. i. 2, p. 778 (1767).  
*Ergolis Ariadne*, Boisduval, Spéc. Gén. Lép. i. pl. 4, fig. 4, *larva* and *pupa* (1836). Butler, Catal. Fabr. Lep. B. M. p. 70 (1869). Wallace, Trans. Ent. Soc. Lond. 1869, p. 332. Distant, Rhop. Malay. p. 137, pl. xi. fig. 6, ♀ (1882). Staudinger, Exot. Schmett. i. pl. 40 (1885). de Nicéville, Butt. of India, ii. p. 10 (1886). Davidson and Aitken, Journ. Bombay Nat. Hist. Soc. 1890, p. 269, pl. C, *larva* and *pupa*. Fruhstorfer, Berl. Ent. Zeit. 1899, p. 89.  
*Papilio Coryta*, Cramer, Pap. Exot. i. pl. 86, fig. E. F. (1776). Herbst, Pap. pl. 181, fig. 3, 4 (1794).  
*Ariadne Coryta*, Horsfield, Catal. Lep. Mus. E. I. C. i. pl. 6, fig. 2, ♂, pl. 7, fig. 6, *larva* and *pupa* (1829).  
*Ergolis Coryta*, Moore, Catal. Lep. Mus. E. I. C. i. p. 144, pl. 6, fig. 6, *larva* and *pupa* (1857).  
*Ergolis alternus*, Moore, Proc. Zool. Soc. 1878, p. 698.  
*Ergolis minorata*, Moore, Lep. of Ceylon, i. p. 44, pl. 23, fig. 2, 21, ♂ (1881).  
*Ergolis Indica*, Moore, Journ. As. Soc. Bengal, 1884, p. 20.  
*Ergolis pallidior*, Fruhst. Berl. Ent. Zeit. 1899, p. 90.

IMAGO.—Male. Upperside rufous or reddish-ochreous, brightest in the wet season brood. Cilia black, alternately edged with white. *Forewing* with a small white subapical costal dentate spot; cell crossed by a slightly-defined blackish slender short basal line, two sinuous or a looped mark across the middle, an angular line beyond and continued below to the submedian vein, and an angular discocellular line; followed by a transverse inner-discal angulated waved line, two outer-discal sinuous lines, the outer one being sometimes obscure, and the inner line acutely pointed in the interspace of lower radial and upper median, and then a submarginal more distinct sinuous line, the extreme outer marginal edge being also slenderly blackish. *Hindwing* with the costal border to the lower subcostal branch more or less distinctly suffused with purple-red and speckled with greyish-white scales, and with the two subcostal branches more or less prominently lined with greyish-white scales; a slender blackish basal cell looped-mark, a slender waved line across its middle which extends upward to the costa and below to the submedian vein, and a discocellular line; followed from the lower subcostal by a transverse inner-discal curved waved line, two outer-discal sinuous lines, and then a more distinctly sinuous submarginal line, between which latter, in most specimens, is a traversing series of very obscure dusky lunules. Underside. Ground-colour dull pale castaneous-brown in dry-season brood, or more or less greyish castaneous-brown in the wet-season brood. *Forewing* crossed by deep rich purplish-castaneous cell-bars, an inner and an outer upper-discal black-edged sinuous band, and a slender submarginal sinuous black line; white apical spot as above; the discal area from upper median to the submedian glossy black, clothed with black elongated oval scales, narrow fan-shaped scales, some of which latter are finely ciliated in front,

and a few narrower or very slender scimitar-shaped scales with, apparently, a short apical single cilia. *Hindwing* crossed by three curved sinuous black-edged deep rich purplish-castaneous bands, and a submarginal slender sinuous black line. The outer band on both wings is the broadest, and encloses an outwardly traversing series of diffused black lunules. *Body* rufous; palpi and legs greyish-black; antennæ black.

Female. Upperside somewhat paler and duller coloured; all the transverse markings as in male, but more regularly defined, those on the hindwing being continued to the costa. Underside as in male, except that the lower discal black patch on forewing is not present.

Expanse, ♂  $1\frac{6}{10}$  to  $2\frac{2}{10}$ , ♀  $1\frac{6}{10}$  to  $2\frac{4}{10}$  inches.

LARVA.—“Cylindrical; slender; segments with two dorsal rows of sharp spines with three or four fine branch spines springing from a point in the middle of each; two rows of similar but shorter spines on each side; head with one pair of long, strong, and straight spines, irregularly set with small spines which cluster at the end. Colour dark brown with an interrupted, broad, dorsal stripe of pure white bars, not extending to either end.”

PUPA.—“Rigidly attached by the tail, so that if the surface is vertical, the pupa stands out horizontally. Slender. Wing-cases somewhat dilated; a dorsal protuberance, and two small cephalic points. Colour variable” (Davidson and Aitken l.c.).

HABITAT.—India; Ceylon; Burma; Tenasserim; Malay Peninsula; Sumatra; Java; Borneo; Hongkong; Tonkin; Hainan; Formosa.

NOTE.—The South Indian specimens are generally smaller than those from North India and Burma, and those from Ceylon are of a uniformly still smaller size. There is no other difference except in size.

DISTRIBUTION, HABITS, ETC.—“This is as common a species as *E. Merione*. I have taken it at all seasons in Calcutta, and rarely in Sikkim. There are specimens in the Indian Museum, Calcutta, from Orissa, Sibsagar, Silhet, Cachar, Bombay. Col. Swinhoe has taken it as far west as Deesa in Rajputana; the Wynaad, Calicut, South India, Ceylon, Upper Tenasserim, Mergui Archipelago, and Java. Mrs. Wylly reared the larva at Khorda, Orissa, on the Bichitée, *Tragia involucrata*, a twining plant with hairy and stinging leaves; the larva above being black, with a narrow dorsal stripe starting near the head and ending before reaching the tail, composed of transverse stripes and dots of yellow; beneath and legs purplish-red. Body covered with six even rows of three-branched spines; the head black, with two long many-branched spines. It moves its head from side to side when walking. Pupa attached to the food-plant by its tail, and stands out from it nearly horizontally, the body of the pupa slightly curved downwards; perfect insect

emerges in about ten days. The colour of the pupa seems variable; those I have bred in Calcutta when attached to the green stem, and amongst the green leaves of the food-plant were coloured green also; the brown pupæ may be attached to dead leaves or stalks" (de Nicéville, Butt. Ind. ii. 10). Mr. W. Doherty obtained it at "Ranibagh and the Tarai, at 1000 feet, in Kumaon" (J. A. S. Beng. 1836, 124). We possess a male labelled Masuri. The late Capt. H. L. Chaumette, in a MS. Note, says it is "an Oudh insect, of slow floating flight, over low bushes, and round and round higher ones, as if playing hide and seek, seldom actually settling, but appearing as if about to do so, or to hide within the bush." Col. C. Swinhoe records its capture in "Poona, September to February; Mahableshwar in May, and in Bombay" (P. Z. S. 1885, 129). In Sikkim it is "rarer than *Merione*, but found occasionally up to 5000 feet elevation throughout the year" (H. J. Elwes, Tr. Ent. Soc. 1888, 335). Col. C. Swinhoe records it from the Khasias (Tr. Ent. Soc. 1893, 277). Mr. J. Rothney found it "common at Barrackpore, near Calcutta, from early March to end of October" (Ent. M. Mag. 1880). Mr. J. Davidson and E. H. Aitken "reared the larva in Guzerat, Bombay, on *Tragia cannabina*, and in Kharwar on *T. involuerata* in June and August. Both plants sting like Nettles. The larva is a restless little creature, and moves its head from side to side when walking" (Journ. Bombay N. H. S. 1890, 269). Mr. G. F. Hampson records it from the Nilgiris (J. A. S. Beng. 1888, 352). Capt. E. Y. Watson found it "common in Mysore, taken at Kolar in October, in Banavar, Lukvalli, and Kathlekan, in November" (J. Bombay N. H. S. 1890, 3). Specimens taken by Capt. Watson in Berhampore and Gangam, in July, are in the British Museum Collection. Mr. H. S. Ferguson records it from Travancore (J. Bombay N. H. S. 1891, 7). In Ceylon, Mr. F. M. Mackwood says it is "found in low country and hills up to 4000 feet elevation, and is less common than *E. taprobana*, May to June in greatest number" (Lep. Ceylon, i. 44). In Burma, Col. C. H. E. Adamson, found it common throughout the year, wherever the Castor-oil plant grows (List, 1897, 17). Signor L. Fea took it at Bhamo in September. Capt. C. T. Bingham obtained it in the Thoungyeen Valley, Upper Tenasserim, in October. Dr. N. Manders found it quite a common species in the Shan States, Burma, at suitable elevations" (Tr. Ent. Soc. 1890, 520). It was obtained in Tavoy by the native Collector, Moti Ram (J. A. S. Beng. 1887, 420), and Dr. J. Anderson took it on King Island, Mergui, in January (J. Linn. Soc. Zool. 1886, 35). Mr. H. Druce records it from Nahconchaisee, Siam. It also occurs in the Malay Peninsula, Sumatra, Java, Borneo, Hongkong, Tonkin, Hainan, Formosa.

Of our illustrations of this species on Plate 382, fig. 1, larva and pupa, is copied from Messrs. Davidson and Aitken's published figures; fig. 1a, larva and pupa, from Mr. Arthur Grote's Calcutta drawings; fig. 1, b, c, represents a dry-season male,

and fig. 1, d, e, a wet-season male, both from Burma; fig. 1, f, g, is from a female taken at Buxa, Bhotan.

### ERGOLIS MERIONE.

*Papilio Merione*, Cramer, Pap. Exot. ii. pl. 144, fig. G. H. (1777).

*Ergolis Merione*, Butler, Catal. Fabr. Lep. B. M. p. 70 (1869). Wallace, Trans. Ent. Soc. Lond. 1869, p. 332. Distant, Rhop. Malay. p. 138, pl. 15, fig. 6, ♀ (1883). de Nicéville, Butt. of India, ii. p. 8 (1886).

*Papilio Cortinna*, Herbst, Pap. vii. p. 110, pl. 181, fig. 1, 2. ♀ (1794).

*Ergolis Nicévillei*, Fruhstorfer, Berl. Ent. Zeit. 1899, p. 93.

*Wet-season brood* (Plate 383, fig. 1, 1a, ♂; 1b, c, ♀).

IMAGO.—Male. Upperside reddish or brownish-ochreous; cilia black, alternately narrowly edged with white. *Forewing* with a small white subapical costal dentate spot; cell crossed by two more or less slightly-defined blackish slender sinuous subbasal lines, two lines across the middle, each continued below the cell to submedian, and two short waved lines enclosing the discocellulars; followed by two transverse inner-discal somewhat recurved sinuous lines, a more slender medial-discal sinuous line, and then an outer-discal more-defined dentated line; between the two latter lines is a row of very obscure dusky dentate speckled spots; beyond is a slender submarginal sinuous line. *Hindwing* with the costal border greyish-white; the subcostals slightly grey lined; cell crossed by more or less slightly-defined slender blackish sinuous lines continuing below to the submedian; two straight lines enclosing the discocellulars, followed by two inner-discal and two outer-discal sinuous lines extending only to the lower subcostal, the two latter enclosing a row of obscure diffused castaneous-speckled dentate spots; beyond is a slender submarginal sinuous line. Underside. Ground-colour dull or pale greyish castaneous-brown. *Forewing* with a subcostal white spot, and a *lower discal broad glossy black patch*, which is clothed with a few oval and longer narrower scales, and very numerous long hair-like scales, which latter are, either of equal hair-like width to near the tip where they are imperceptibly laterally-dilated and tipt with two divergent extremely fine longish ciliæ, or, these scales are more or less slightly broader and flattened throughout and dilated a little at the tip, with two similar divergent fine ciliæ; cell-marks, inner and outer upper-discal blackish-edged band rich purplish-castaneous; and a submarginal blackish sinuous line. *Hindwing* crossed by a subbasal cell-mark, and three curved sinuous black-edged deep rich purplish-castaneous bands, the outer band enclosing a row of blackish-castaneous dentate spots; beyond is a submarginal slender black sinuous line. *Body* above



reddish or brownish-ochreous, beneath and legs greyish-brown; palpi brown above, greyish-brown beneath, tipt with black; antennæ ochreous.

Female. Upperside somewhat paler and duller coloured; the subapical white spot prominent; all the transverse markings as in male, those on its hindwing being continued to the costa. Underside more or less pale brownish-ochreous or greyish-ochreous; all the transverse markings less prominent than in male, and those on the forewing continued to the posterior margin.

Expanse, ♂ 2 to  $2\frac{6}{10}$ , ♀  $2\frac{2}{10}$  to  $2\frac{6}{10}$  inches.

*Dry-season brood* (Plate 383, fig. 1, d, e, f, ♂ ♀).

*Ergolis tapestrina*, Moore, Journ. Asiatic Soc. Bengal, 1884, p. 19.

Male and female. Upperside paler than in wet-season brood, brownish-ochreous; with similar transverse sinuous lines on both wings, the two inner-discal lines being somewhat nearer together, the two outer-discal lines forming slightly-defined cordate marks; the interspaces between the basal lines, the subbasal and medial lines, the discal cordiform marks and the marginal line, and the outer margin, are distinctly of a more dusky colour, thus giving the wings the appearance of being marked with alternate pale and dusky transverse sinuous bands. Underside also paler, especially in the male, in which sex the transverse castaneous bands are duller, and much less defined, those in the female being also less defined.

Expanse, ♂  $1\frac{8}{10}$  to 2, ♀  $2\frac{2}{10}$  to  $2\frac{4}{10}$  inches.

LARVA.—Cylindrical, slender; segments armed with two dorsal and two lateral rows of short branched-spines; head with a pair of long straight branched-spines. Colour green, with dorsal longitudinal dark brown lines.

PUPA.—Similar to that of *E. Ariadne*.

HABITAT.—Northern and Continental India; Burma; Tenasserim; Malay Peninsula; Penang; Sumatra.

DISTRIBUTION.—“This is a common species; I have taken it plentifully in Calcutta and in Sikkim at low elevations, but only on one occasion at Simla. It occurs also rarely at Masuri. Mr. S. E. Peal obtained it at Sibsagar in Upper Assam, and Mr. Wood-Mason took it in Cachar. Mr. W. C. Taylor found it common in Orissa. Col. Swinhoe has taken it at Deesa, in Rajputana, and has received it from the Nilgiris; Capt. C. T. Bingham obtained it in the Thoungyeen Valley, and the Donat Range in Upper Tenasserim in the early months of the year” (de Nicéville, l.c. p. 9). We possess a male from Kashmir, received from the late Capt. R. Bayne Reed, also examples from Nepal, Bhotan, Bengal, Dehra Dhun, Manipur (C. Horne), Poona, *wet-season form*, taken by Col. C. Swinhoe in June, and *dry-season form*, taken in November and January; others from Chittagong; *wet form*

taken in August, and *dry form*, taken in October and November, in the Karen Hills (Signor L. Fea); Mandalay; and Pyia Myoung, Shan States, taken by Col. C. H. E. Adamson. It was taken at Masuri in October, by Major H. B. Hellard (MS. Notes). Mr. W. Doherty obtained it in the "Gori and Kali Valley, Kumaon, at 2000 to 4000 feet elevation" (J. A. S. Beng. 1886, 124). Mr. P. W. Mackinnon records it as "very common in the Dehra Dhun, where the food plant of its bright green spiny larva, the Castor-oil plant (*R. communis*), grows. Found also occasionally in Masuri, in August" (J. As. Soc. Beng. 1897, 368). It occurs in the Khasia Hills (Col. Swinhoe, Tr. Ent. Soc. 1893, 277). Mr. J. Rothney found it common at Barrackpur, near Calcutta, from early March to end of October (Ent. M. Mag. 1880). In Sikkim it is "a common species at low elevations, and more or less throughout the year" (H. J. Elwes, Tr. Ent. Soc. 1888, 335). Colonel C. Swinhoe has examples taken at Poona. Mr. G. F. Hampson took it in the Nilgiris (J. A. S. Beng. 1888, 352). Capt. E. Y. Watson obtained it at Berhampur and Ganjam, Madras. Mr. H. S. Ferguson records it from Travancore (J. Bombay N. H. S. 1891, 7). Signor L. Fea took it in Burma, at Meteleo, 900 to 1000 feet, in June and September, and at Bhamo in September. Col. C. H. E. Adamson found it "common in Burma wherever the Castor-oil plant grows, all the year round" (List, 1897, 17). Dr. N. Manders found it "commonly at elevations from 1000 to 3000 feet, in the Shan States, and less common from 3000 to 5000 feet" (Tr. Ent. Soc. 1890, 520). It was taken in Tavoy by the native Collector, Moti Ram (J. As. Soc. Beng. 1887, 420). Dr. J. Anderson obtained it on Elphinstone Island, Mergui, in March (J. Linn. Soc. Zool. 1886, 35).

#### ERGOLIS TAPROBANA.

*Ergolis Taprobana*, Westwood, Gen. D. Lep. ii. p. 410, pl. 68, fig. 4, ♂ (1851). Moore, Lep. of Ceylon, i. p. 44, pl. 23, fig. 1, 1a, b, ♂ ♀ (1881). de Nicéville, Butt. of India, ii. p. 9 (1886). Fruhstorfer, Berl. Ent. Zeit. 1899, p. 93.

*Wet-season brood* (Plate 384, fig. 1, 1a, b, c, ♂ ♀).

IMAGO.—Male and female. Wings shorter, and the exterior margins more even than in *E. Merione*. Male. Upperside richer and darker reddish-ferruginous. *Forewing* with no subapical white spot; cell crossed by five black slender sinuous lines, and two even lines enclosing the discocellulars, the second, third and fourth line continued below to the submedian vein; followed by two transverse inner-discal and a medial-discal sinuous line, then an outer-discal dentated line, the two latter lines are joined along the veins and thus form a row of more or less defined cordiform marks, each interspace also enclosing an obscure dusky dentate spot; beyond is a submarginal slender sinuous line. *Hindwing* with the costal border

grey, the subcostal branches slightly grey-lined; cell crossed by slender black sinuous lines continuing to the submedian vein, and two straight discocellular lines; followed by two inner-discal and two outer-discal sinuous lines which extend only to the radial veinlet, the latter two sometimes only to the upper median and enclosing in each interspace an obscure dusky castaneous dentate spot; beyond is a slender shortened submarginal sinuous line. Underside. Ground-colour greyish-brown or pale greyish castaneous-brown; transverse sinuous lines more or less indistinct. *Forewing* with a slightly apparent subapical greyish spot; a *broad lower discal prominent glossy blackish-brown patch*, which is clothed with a few broad oval and longer narrower scales, and numerous long hair-like scales, which latter are, either of equal hair-like width to near the tip, where they are imperceptibly dilated laterally and tipped with two divergent extremely fine longish cilia, or these scales are more or less slightly flattened and broader throughout, dilated a little at the tip and with two similar divergent fine cilia; the cell interspaces and upper discal area clouded with dense rich purplish-castaneous. *Hindwing* with the discal area from the costa to middle median veinlet clouded with rich dense purplish-castaneous.

Female. Upperside slightly paler; transverse markings as in male, those on the hindwing being continued to the costa. *Forewing* with a small subapical white dentate spot. Underside. Ground-colour more or less brownish-grey; subapical white spot on forewing distinct; the cell-marks and transverse sinuous black-edged bands rich purplish-castaneous.

Expanse, ♂ ♀  $1\frac{8}{10}$  to  $2\frac{2}{10}$  inches.

*Dry-season brood* (Plate 384, fig. 1d, e, f, ♀).

Upperside paler brownish-ochreous than in wet-season specimens, the transverse sinuous interspaces being alternately pale ochreous and dusky, similar to those in dry-season form of *E. Merione*. Underside duller coloured; the transverse castaneous bands less defined.

Expanse,  $1\frac{8}{10}$  to 2 inches.

HABITAT.—Ceylon; South India.

DISTRIBUTION AND HABITS.—In Ceylon it is “widely distributed in low country and hills up to 6000 feet, both in forest and cultivated lands. Found all the year in the hills, variable and not so common in the plains. Flight slow, skimming, but shy, and not easy to capture” (Capt. Hutchison, MS. Notes). Mr. F. M. Mackwood also found it “common, in Ceylon, all the year round in low country and up to 4000 feet” (Lep. Ceylon, i. 44). In South India, Colonel J. W. Yerbury took it at Khandalla, in the Western Ghats, in October, and also at Lanowlie in September. Col. C. Swinhoe has examples taken at Mahableshtar, Matheran and Trevandrum. Mr. H. S. Ferguson records it from Travancore (J. Bombay, N. H. S. 1891, 7). We

possess specimens from Ceylon, Travancore, Nilgiris, Wynaad, Malabar, Khandalla, and Bombay. Messrs. Davidson and Aitken say, "It is one of the commonest butterflies in the Kanara District, frequenting forest rather than cultivated places or open plains. The larva of this species, and of *E. Ariadne*, both feed on *Tragia involucrata*, a creeper with stinging leaves, and both butterflies have emerged from one lot of larvæ in our cages which might easily have been taken to belong to a single brood. In form there is no difference, and the colour we thought was too variable to have any significance, ranging from pale green with or without brown lines, to black with a broad dorsal stripe of pure white. This year, however, we have bred a larger number and carefully separated the black larvæ from those in which the ground colour was green, and found that the former produced *Ariadne*, and the latter *Taprobana*" (Journ. Bombay, N. H. S. 1896, 247).

INDO-MALAY SPECIES.—*Ergolis specularia*, Fruhst. Berl. Ent. Zeit. 1899, p. 91. *Habitat.* W. Java.—*Ergolis macularia*, Semper, Reis. Phil. Lep. p. 66, pl. 13, fig. 5, 6, ♂ ♀ (1887). *Habitat.* Luzon, Philippines.—*Ergolis Luzonia*, Felder, Reis. Nov. Lep. p. 450 (1867). Semper, Reis. Phil. Lep. p. 66, pl. 13, fig. 2, 3, 4, ♂ ♀. *Habitat.* Luzon; Palawan.—*Ergolis Tæniata*, Felder, Wien. Ent. Monats. 1861, p. 303; *id.* Reis. Nov. Lep. pl. 61, fig. 1, 2, ♀ (1867). Semper, l.c. p. 65, pl. 12, fig. 11, 12, 13, ♂ ♀. *Habitat.* Luzon; Philippines.—*Ergolis Adelpha*, Feld. Wien. Ent. Mon. 1861, p. 303, ♂. Semper, l.c. p. 65, pl. 12, fig. 9, 10, ♂ ♀. *Habitat.* Mindanao.—*Ergolis Isæus*, Wallace, Trans. Ent. Soc. Lond. 1869, p. 333. Distant, Rhop. Malay. pp. 139, 441, pl. 39, fig. 6. Fruhst. Berl. Ent. Zeit. 1899, p. 95. *Habitat.* Malay Peninsula; Sumatra; Java.—*Ergolis pupillata*, Fruhst. Berl. Ent. Zeit. 1897, p. 338; *id.* 1899, p. 98. *Habitat.* Nias Island.—*Ergolis Ahmat*, Pryer and Cator, N. Borneo Herald, 1891, p. 259. *Habitat.* N. Borneo.—*Ergolis Telok*, Pryer and Cator, l.c. p. 260. *Habitat.* N. Borneo.

#### Genus LARINGA.

*Eurytela* (part), Boisduval, Westwood; de Nicéville.

IMAGO.—Male and female. *Forewing* subtriangular; costa very slightly arched at the base, apex pointed; exterior margin slightly oblique, concave below the apex, acutely angled outward at end of upper radial, concave below the angle and slightly scalloped hindward; posterior margin recurved; costal vein swollen at the base; first and second subcostal branches emitted before end of the cell, third branch at one-third beyond the end, fourth at nearly two-thirds beyond; cell broad; two upper discocellulars outwardly oblique, upper extremely short, second also short and concave, lower long, erect and slightly concave posteriorly; two upper median branches emitted from lower end of cell; submedian recurved. *Hindwing* short,

triangularly-ovate; exterior margin obliquely convex and slightly scalloped; pre-costal very straight and bifid at tip; costal vein arched from the base, extending to apex; cell short; upper discocellular outwardly-oblique, starting from close to base of lower subcostal, lower discocellular long and outwardly-oblique, slender; two upper median branches from end of the cell. *Body* moderately slender; head and thorax woolly; palpi porrect, elongated, clothed with compact hair-scales to the tip, second joint extending half its length beyond the front, third joint thick; antennæ with a very slenderly-formed club; eyes naked. Forelegs of *male* very slender, short, femur very delicately hairy at the sides and beneath; tibia and tarsus together a little longer than the femur, both finely hairy; forelegs of *female* also slender, longer than in male, finely scaly, femur and tibia about equal length, tarsus of nearly the same length and slightly stouter, with three subterminal joints and a terminal minute joint, each with a pair of short spines. Sexes dissimilar.

TYPE.—L. Horsfieldii.

Differs from typical *Eurytela* (Dryope) in the forewing being comparatively narrower, the costa straighter, the apex and outer angle of exterior margin more acutely pointed. *Hindwing* comparatively shorter, the exterior margin more oblique and less scalloped. Venation similar. Palpi shorter, more robust, and compactly clothed to the tip. Forelegs of female shorter, and the tarsal joints longer; the eyes are naked. The species of this genus are found only in the East, one in the Andaman Isles, and others in Burma, Tenasserim, Malay Peninsula, Sumatra, Java, Borneo and Palawan.

The typical species of *Eurytela* occur only in Africa; the sexes are similar in their coloration and markings both on the upper and under side, and these are quite different to the pattern and colours of their Eastern representatives; also their eyes are hairy.

HABITS AND MIMICRY.—“Capt. E. Y. Watson has noted that their flight is like that of *Neptis*, as they fly with wings extended flat, parallel with the ground; they settle on the tips of leaves with open wings, and then raise their wings slowly over their backs. This I can confirm, having seen *Eurytela*, *Horsfieldii* alive in the forests in N.E. Sumatra. The female on the wing reminds one at once of a tawny *Neptis*, or more closely of a species of *Ergolis*, which is, I believe, a protected genus, and of which the very differently-coloured female is probably a mimic” (L. de Nicéville, J. As. Soc. Beng. 1894, 108). “The females of *E. Castelnani* are splendid mimics of *Ergolis Isaus* and *Ariadne*, *Eurytela Castelnani* mimicking *Erg. Isaus*, and *Eurytela Horsfieldii* mimicking *Er. Ariadne*. Even in the way of flying they closely resemble the flight of *Ergolis*. The males always settle with folded wings for greater protection, and have some predilection for the sandy banks of small streams running through the forest” (de Nicéville, *id.* 1895, 399).

**LARINGA CASTELNAUI** (Plate 385, fig. 1, 1a, ♂, 1b, c, ♀).

*Eurytela Castelnau*, Felder, Wien. Ent. Monats. iv. p. 401 (1860); *id.* Reise Novara, Lep. iii. p. 450, pl. 61, fig. 5, 6, ♂ (1867). Wallace, Trans. Ent. Soc. Lond. 1869, p. 331. Distant, Rhop. Malayana, p. 136, pl. 15, fig. 10, ♂, p. 441, pl. 43, fig. 10, ♀ (1883-6). Staudinger, Exot. Schmett. p. 105, pl. 39, ♂ (1885). de Nicéville, Butt. of India, ii. p. 13 (1886). *id.* Proc. As. Soc. Bengal, 1895, p. 108; Journ. As. Soc. Bengal, 1895, p. 399.

IMAGO.—Male. Upperside. Both wings ultramarine blue, without gloss; outer margins slenderly edged with black, and with a submarginal slender black lunular line; costal edge of forewing, and of the hindwing broadly to the subcostal, and also its inner margin dusky-brown. Cilia black, alternated with white. Underside. Both wings grey, and almost covered with dark brown slender strigæ, which are most densely packed and confluent across the discal areas; a transverse subbasal and two discal waved diffused blackish lines, and a slender submarginal lunular line. *Body* above blue; palpi black; body and palpi beneath and legs greyish-brown; antennæ blue-black.

Female. Upperside ochreous-brown. *Forewing* with the basal area to middle of the disc, and hindwing with the base, a broad discal band, and the outer margin dark brown. Both wings crossed by a subbasal, two discal and a submarginal waved blackish line; the upper and lower discal interspace at its outer-discal area of forewing, and the inner and outer-discal area of hindwing speckled with brown strigæ. Underside sullied greyish-ochreous, numerously covered with short brown strigæ; crossed by a waved subbasal, two discal, and a sinuous submarginal blackish line. *Body* and palpi above brown, beneath greyish-ochreous.

Expanse, ♂ 2, ♀ 2 $\frac{2}{10}$  inches.

HABITAT.—Tenasserim; Malay Peninsula; Sumatra; Borneo; Palawan.

DISTRIBUTION.—Mr. L. de Nicéville records it from the "Daunat Range, Upper Tenasserim, Malay Peninsula, Sumatra, Borneo, and Palawan" (J. As. Soc. Beng. 1895, 109). A male, from the Attaran Valley, Upper Tenasserim, taken in February by Col. C. H. Bingham, is in the British Museum. Mr. H. Grose-Smith has a male from Singapore, from Wallace's collection, a female from Sumatra, and a male from Sarawak, Borneo. Mr. F. Godman has both sexes from Palawan.

**LARINGA GLAUDESCENS** (Plate 385, fig. 2, 2a, ♂; 2b, c, ♀).

*Eurytela glaucescens*, de Nicéville, Proc. Asiat. Soc. Bengal, 1895, p. 110.  
*Eurytela Horsfieldii* (part), de Nicéville, Butt. of India, ii. p. 12 (1886).

IMAGO.—Male. Upperside dark violescent-greyish bluish-brown; cilia alternated with white. *Forewing* with a subbasal transverse curved waved slender black line, a

medial-discal irregular slender more distinct black line, which is broadly angled outward between the upper radial and upper median, followed by an outer-discal sinuous black line; the anterior and posterior interspace between the two latter lines being sharply defined, and pale virescent bluish-grey speckled with darker scales, thus forming a well-defined upper and lower fascia, its outer edge being also diffusely bordered by a darker tint of the same colour; beyond is a less-defined submarginal black sinuous line. *Hindwing* with a subbasal transverse slender blackish line, a more distinct inner-discal anteriorly-waved line, followed by an outer-discal less-defined diffused line, the interspace between the two latter lines being virescent bluish-grey with darker speckles, and diffusely bordered outwardly by a darker tint of the same colour, followed by a submarginal more or less defined black fascia. Underside. Both wings dull bluish-grey, very numerous covered with dark brown short strigæ, which are more densely packed and darkest across the outer disc; crossed by a subbasal, inner and outer-discal, and a submarginal slender black irregular waved line.

Female. Upperside ochreous-brown, densely covered with darker strigæ. Both wings with transverse blackish lines, disposed as in the male. *Forewing* with the upper and lower interspace of the discal lines pale dull ochreous and less speckled with brown strigæ. *Hindwing* with the basal area and outer disc also pale dull ochreous and less speckled; the outer-discal blackish fascia diffused. Underside pale sullied greyish-ochreous, numerous covered with fine short brown strigæ; crossed by a blackish subbasal, two discal, and an outer marginal line, as in the male. *Body* and palpi of male above greyish bluish-brown, beneath and legs pale bluish-grey; antennæ blackish; body of female ochreous-brown above, beneath and legs pale greyish-ochreous.

Expanse, ♂ 2 to  $2\frac{2}{10}$ , ♀  $2\frac{2}{10}$  inches.

HABITAT.—Burma.

DISTRIBUTION.—The type specimens were taken at "Papun in November and December, at Methalauk in November, Karen Hills, 500 to 1500 feet elevation, in December, Toungu in December, and at Meple in October and December" (de N. l.c. 110). Col. C. H. E. Adamson records one male (as *Horsfieldii*), taken in October near Kannee, and one female (as *Castelnavi*), taken in the Thoungyeen Valley, Amherst District, Upper Tenasserim, in May (List, 1897, 17). We have verified these two specimens. Mr. H. J. Elwes records two males (as *Horsfieldii*) from the "Karen Hills, taken by Mr. W. Doherty, and one from Singmo, Shan States, Burma, taken by Dr. Manders" (P. Z. S. 1891, 272). Signor L. Fea took it at "Leito, Karen Hills, in January." Dr. N. Manders obtained "one specimen at Fort Stedman, Shan States" (Tr. Ent. Soc. 1890, 520). Mr. H. Grose-Smith has examples obtained by Mr. Hawxswell in the Attaran Valley, Upper Tenasserim, in March. Specimens from

the Karen Hills, and Methalauk, Papun, taken in November, are in the British Museum.

### LARINGA ANDAMANENSIS.

(Plate 386, fig. 1, 1a, b, c, ♂ ♀ (*wet-season brood*), 1d, e, f, ♂ ♀ (*dry-season brood*)).

*Eurytela Andamanensis*, de Nicéville, Proc. Asiatic Soc. Bengal, 1895, p. 110, ♂ ♀.

*Eurytela Horsfieldii*, Moore, Proc. Zool. Soc. Lond. 1877, p. 585. Wood-Mason and de Nicéville, J. As. Soc. Beng. 1880, 228. de Nicéville, Butt. of India, ii. p. 12, pl. 18, fig. 69, ♀ (1886), *nec Boisl.*

IMAGO.—Male. Upperside deep blue-black; cilia white, alternated on forewing with black at end of upper radial and lower medians. *Forewing* with a slightly-defined black subbasal transverse curved waved line, a subapical bluish-white diffused sinuous oblique band, and another wider band across middle of the disc, both these bands being inwardly sharply defined, and outwardly continuously-bordered by diffused slaty-blue, extending from below the outer angle almost to the outer margin, and bearing a submarginal black diffused waved line, which is dilated at the costal end; inner-discal border of the lower band also diffusedly slaty-blue. *Hindwing* with the basal area densely slaty-blue speckled; the inner-discal area crossed by a broad bluish-white diffused band, which is traversed by a slender more or less apparent blackish wavy line; and a more distinct bar at end of the cell; the white band outwardly bordered by slaty-blue, followed by a broad blue-black submarginal band, and then a marginal slaty-blue band; cilia white. Underside. Both wings bluish-grey, densely mottled and transversely clouded with fuliginous-black short strigæ, especially across the disc, the outer margins being palest; crossed by a black subbasal nearly straight line, and two discal irregular-waved lines, the outer line being more or less ill-defined or lost among the dark scales; followed by a submarginal slender black sinuous line; a slender black line also crossing end of the cell.

Female. Upperside ferruginous-ochreous or brownish-ochreous; cilia dusky-white. *Forewing* crossed by a slender blackish curved subbasal line, a line at end of the cell, a subapical and a lower-discal broad pale yellowish-ochreous sinuous band, followed by a paler and clouded outer border traversed by a submarginal slender sinuous black line. *Hindwing* with the basal area to the outer disc pale yellowish-ochreous, the base densely speckled with brownish-ochreous scales; crossed by a slender subbasal blackish straight line, a discocellular line, a waved inner-discal line, and a more or less diffused outer-discal line, followed by a slender submarginal slightly sinuous line; the outer border from the outer-discal line being brownish-ochreous, and the submarginal interspace bearing more or less diffused dusky-ochreous or blackish-ochreous patches. Underside. Both wings pale ochreous,



mottled and speckled with brownish-ochreous short strigæ; with transverse lines similar to upperside; the discal bands palest and less speckled with dark scales. *Body* of male above blue-black, beneath and legs greyish; palpi above brown, grey beneath; antennæ black above, white speckled beneath; body of female brownish-ochreous above, beneath and legs pale ochreous.

Expanse, ♂ 2 to  $2\frac{2}{10}$ , ♀ 2 to  $2\frac{4}{10}$  inches.

HABITAT.—South Andamans.

INDO-MALAY SPECIES.—*Laringa Horsfieldii* (Eurytela Horsfieldii, Boisduval, Faun. Ent. Madagascar, p. 54, ♂ (1833). Wallace, Trans. Ent. Soc. Lond. 1869, p. 331. de Nicéville, Proc. As. Soc. Bengal, 1895, p. 109. *Syn.* E. Stephensi, Boisd. l.c. p. 54, ♀. *Habitat.* Java; N.E. Sumatra.—*Laringa Fruhstorferii* (Eur. Fruhstorferii, de Nicéville, Proc. As. Soc. Bengal, 1895, p. 109; *id.* Journ. Bombay Nat. Hist. Soc. 1895, p. 23, pl. S, fig. 14, ♂. *Habitat.* Central Java.—*Laringa Niha* (Eur. Niha, Fruhstorfer, Ent. Nachr. 1896, p. 39). *Habitat.* Nias Island.

### Sub-family ACRÆINÆ.

*Lemonides* (part), Hübner, Verz. bek. Schmett. p. 26 (1816).

*Acreeide*, Doubleday, Gen. D. Lep. i. p. 137 (1848). Doherty, Journ. As. Soc. Bengal, 1886, p. 109. Staudinger and Schätz, Exot. Schmett. ii. p. 101 (1887).

*Acreeina*, Bates, Journ. Ent. ii. p. 176 (1864). Kirby, Syn. Catal. D. Lep. p. 130 (1871); *id.* Allen's Nat. Hist. Butt. i. p. 32 (1894). Moore, Lep. of Ceylon, i. p. 65 (1881). de Nicéville, Butt. of India, i. p. 317 (1883). Jordan, Nov. Zool. v. p. 387 (1898).

### CHARACTERS OF THE ACRÆINÆ.

IMAGO. Wings never thickly covered with scales, either opaque or partially or entirely diaphanous. Cells closed. *Forewing* subtriangular, elongate, the apex more or less rounded, outer margin either nearly straight or rounded. *Hindwing* obovate; the inner margin free from the abdomen, and not channelled to enclose it. *Body* elongate, abdomen much arched, the last segment in the female often furnished with an anal corneous appendage; palpi divergent, rising above the forehead, sparsely hairy, basal joint short; forelegs short, slender, smoothly scaled or clothed with slight spiny hairs; *fore tarsus of male* sometimes, apparently, single jointed, or four or five jointed, cylindrical or slightly fusiform, clothed with spiny hairs; *fore tarsus of female* four or five jointed, each with a terminal pair of spines; antennæ with an abruptly clavate club; eyes prominent.

LARVA.—Cylindrical; segments armed with longitudinal rows of rigid branched-spines.

PUPA.—Suspended; slender; elongated.

HABITS.—“The *Acraïnae* are butterflies of very slow flight, and usually congregate in some numbers in their favourite haunts. Some species prefer open localities, where they bask with expanded wings on low flowers, strongly reminding one of the European *Melitææ*, others the outskirts of woods, and some are thoroughly sylvan. The deliberate movements of these butterflies and their complete disregard of concealment, in conjunction with their conspicuous appearance, indicate very clearly that little if any active persecution of them is carried on; in common with the *Danainæ*, they owe this immunity to their malodorous and uneatable nature, which leads insectivorous animals to pass them by. The peculiar odour of these butterflies seems to reside chiefly in a bright yellow liquid secretion, which, on pressure of the thorax, exudes somewhat copiously. Many of them are objects of mimicry, by butterflies belonging to other groups.

“The larvæ are very gregarious, feeding in companies, and fully exposed. They emit a rather offensive odour, of the same character, but not so strong, as that in the perfect insect. They feed on plants of several different Orders, and some are very destructive to Passion-flowers in gardens.

“The pupæ are remarkably handsome, and usually very conspicuous from their white or yellowish colour, veined and streaked with black, and marked abdominally with orange and black spots, orange tubercles, or pink filaments. Their showy appearance doubtless serves to indicate to the hungry insectivoræ a distasteful morsel.

“Though ranging throughout the tropical regions, the *Acraïnae* find their main development in Africa and its islands” (R. Trimen, *Butt. of S. Africa*, 130 (1887).

#### Genus PAREBA.

*Acraea* (sect. 5 *Pareba*), Doubleday, *Gen. D. Lep.* i. p. 142 (1848). de Nicéville, *Butt. of India*, i. p. 318 (1883). Leech, *Butt. of China, etc.*, i. p. 114 (1892).

IMAGO.—Male. *Forewing* elongated, narrow, triangular; costal margin to near end almost straight; apex rounded, exterior margin very oblique and slightly convex, even; posterior margin almost straight; costal vein extending to fully three-fourths of the margin; first subcostal emitted at the end of the cell, second at one-third beyond, third at one-half, and fourth at two-thirds beyond; cell long, upper end extending to more than half length of the wing; discocellulars outwardly-oblique, upper extremely short, middle obliquely concave, lower very oblique and almost straight; radials outwardly curved; median branches wide apart, upper branch much curved, middle branch straight and emitted at some distance before lower end of cell, lower branch straight; submedian slightly recurved. *Hindwing* elongated and narrowly oval; anterior margin nearly straight, apex rounded, exterior margin

much rounded, and almost obtusely angular in the middle; inner margin short; cell long and narrowly fusiform; precostal bent upward near its end; costal vein extending close along edge of the margin; discocellulars very oblique, upper emitted at some distance before the subcostal branches; middle median at some distance before lower end of the cell. *Body* somewhat slender; abdomen scaly, last segment of female furnished with an anal corneous appendage\*; head small; eyes prominent, naked; palpi divergent, ascending a little above the head, hairy, apical joint short; antennæ rather thick, with a lengthened club; forelegs short, slender; femur of *male* densely clothed with short thick hair-scales, tibia and tarsus sparsely clothed with sharp-pointed spiny hairs; femur and tibia of equal length; tarsus four jointed; femur of *female* densely clothed with shorter thick hair-scales, tibia and tarsus very sparsely clothed with fine longish spiny-scales; tarsus five jointed, the fifth short, each with a terminal pair of rather long sharp spines.

**LARVA.**—Elongated. Head unarmed; segments armed with a subdorsal and a sublateral row of long sharp-pointed branched-spines, and a lateral row of shorter naked spines.

**PUPA.**—Suspended. Elongated, narrow; head with two short frontal points; thorax convex and uneven; abdominal segments with a dorsal and two lateral rows of short tubercular-points.

**TYPE.**—P. *Vesta*.

**PAREBA VESTA** (Plate 387, fig. 1, *larva* and *pupa*.† 1a, b, c, ♂, 1d, e, f, ♀).

*Papilio Vesta*, Fabricius, Mant. Ins. ii. p. 14 (1787); Ent. Syst. iii. i. p. 163 (1793). Donovan, Ins. of China, pl. 30, fig. 1, ♀ (1799).

*Aræa Vesta*, Godart, Encyc. Méth. ix. p. 233 (1819). Westwood's Edit. Donovan, Ins. China, p. 58, pl. 30, fig. 1, ♀.

*Pareba Vesta*, Doubleday, Gen. D. Lep. i. p. 142 (1848). Moore, Catal. Lep. Mus. E. I. C. i. p. 136 (1857). Butler, Catal. Fabr. Butt. Brit. Mus. p. 132 (1869). Moore, Proc. Zool. Soc. 1882, p. 243, *larva*. de Nicéville, Butt. of India, i. p. 318 (1883). Standinger, Exot. Schmett. i. p. 103, pl. 13 (1886). Leech, Butt. of China, etc., i. p. 114 (1892).

*Papilio Terpsichore*, Cramer, Pap. Exot. iv. pl. 298, fig. A. B. C. (1782), *nec Linn.*

*Telchinia Issoria*, Hübner, Verz. bek. Schmett. p. 27 (1816).

*Acraea anomala*, Kollar, Hügel's Kaschmir, iv. pt. 2, p. 425, pl. 3, fig. 3, 4 (1844).

**IMAGO.**—Both sexes variable. Male. Upperside yellowish-ochreous; the extreme

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\* Mr. G. C. Dudgeon, who has reared this butterfly from larvæ, in Sikkim, informed me that the virgin female does not possess the anal pouch; the pouch being produced, or caused by the action of the male, during or immediately after coition, and is only present after that operation.

† These figures, of larva and pupa, are copies, of Horsfield's drawings, and represent those of the Java form.

base slightly black-speckled. Cilia black. *Forewing* with a bright ochreous basal costal streak; the veins outwardly more or less finely, or for their entire length, black lined; the costal edge, or the costal border broadly to below the subcostal within the cell, the apex and outer margin ochreous-black, the latter being sometimes obsolescent, but always bearing a row of small oval or larger triangular ochreous spots, one in each interspace except the lowest, where there is generally two; a more or less obsolescent blackish discocellular obliquely-curved decreasing bar, or the bar is distinct. In some specimens the discocellular bar is more prominent, and there is also either a black-speckled or completely-black dentate spot, or a recurved bar in middle of the cell, and an upper discal outwardly-oblique series of four spots, which latter are either separate or confluent, below which is an outer oblique speckled streak between the lower median and submedian, or also a dentate spot in the upper median interspace, a rounded spot in base of the lower median interspace, and a larger dentate or broad oblique outer spot between the lower median and the submedian. *Hindwing* with a more or less obsolescent outer marginal row of blackish continuous triangular spots, or these spots are well defined, and have paler ochreous centres, or the marginal black band is well-formed and enclosing a row of small rounded pale ochreous spots. In some specimens the marginal band is inwardly bordered by slight ochreous lunular patches, which are also occasionally black speckled; and occasionally two or three medial-discal very small ochreous or blackish-speckled spots are present. Underside paler yellowish-ochreous, the apex of forewing and the hindwing much the palest, in some almost white; veins black lined. *Forewing* either without markings, or the discocellular bar is slightly apparent, or, in others, the cell, discocellular, and discal marks are more or less slightly defined, and the outer marginal triangular spots traceable, with their inner edge slightly fulvescent bordered. *Hindwing* with the outer marginal slender black-lined triangular spots generally white-centred and inwardly bordered by a fulvous band edged more or less with black speckles. *Body* above glossy-black; front of thorax with two bright ochreous spots; thorax beneath black, spotted with greyish-white; abdomen beneath and lateral spots greyish-white, longitudinally black streaked; legs glossy black; palpi black; antennæ black.

Female. Upperside. Ground-colour either uniformly duller and paler yellowish-ochreous than in male; with the blackish costal and marginal band, cell and discal marks, and outer marginal row of pale ochreous spots, and the markings on the hindwing similar to the male, or, the ground-colour of the forewing is sullied ochreous-white and the hindwing pale yellowish-ochreous; the forewing having all the black markings broad, coalescent and bordering the veins, leaving only the pale interspaces within and below the cell, across the disc and on the outer margin; and, on hindwing the veins are more or less black-edged externally, with or without

medial discal small speckled dots or lunate spots, a broader black lunular or dentated marginal band and outer row of triangular whitish spots, with its inner edge sometimes ochreous and confluent lunularly black speckled. Underside similar to the male, but with the ground-colour paler, or the ground-colour of both wings in some specimens is more or less sullied ochreous-white, or the hindwing only is white; the veins in both being more prominently black-lined.

Expanse, ♂  $2\frac{1}{10}$  to 3, ♀  $2\frac{1}{10}$  to  $3\frac{3}{10}$  inches.

LARVA.\*—Elongated. Head unarmed; segments armed with a subdorsal and a sublateral row of long sharp-pointed branched-spines, and a lateral row of shorter naked spines. Head reddish-ochreous, black spotted, front with a white stripe; segments dark purplish-violet, with longitudinal rows of short transverse white bars; spines ochreous with black tips; legs ochreous with black bands.

PUPA.\*—Suspended. Elongated, narrow; head with two short frontal points; thorax convex and uneven; abdominal segments with a dorsal and two lateral rows of short tubercular points. Colour white, tubercles, and streaks on wing-cases ochreous.

HABITAT.—Himalayas; Assam; Khasia and Naga Hills; Upper Burma, Western and Southern China.

DISTRIBUTION AND HABITS.—“ Found locally throughout the Himalayas from the Chenab to Sikkim, and extending through the Khasia Hills to Upper Burma. Major Marshall has taken it in Chumba in May and June. Mr. A. G. Young notes it (P. Z. S. 1882, 243) as being a very local insect in Kulu, but, where occurring, abundant. It is to be found in wet ravines at from 3000 to 4000 feet elevation. It is not a rapid flier and is easily captured; when at rest it may be taken with the fingers. It is constant in its appearance, frequenting the same localities year after year. The imago does not hibernate.” Baron Hügel obtained it at Masuri. Mr. E. T. Atkinson records it from the submontane tracts of Kumaon. Mr. L. de Nicéville met with it in Sikkim, in profusion at from 2000 to 7000 feet elevation, in October, the larvæ covering the weeds all along the cart-road between Chunabati and Darjiling; in Simla he only met with it in a limited area of about 200 yards in the bed of a stream. The Indian Museum, Calcutta, has specimens from Bhotan, Sibsagar, the Daffa and Khasia Hills and from Upper Burma” (Butt. Ind. i. 319). We possess specimens from Kashmir (Capt. R. Bayne Reed), Kulu, Dehra Dhun, Nepal (Gen. G. Ramsay), Sikkim, Khasias, Burma, Karen Hills (Sig. L. Fei). Col. C. Swinhoe has it from Kulu, and also numerous examples from the Khasias. In the British Museum are examples from Simla and Kulu; Shillong, Assam; Nepal; Sikkim, taken in July and August by Mr. Dudgeon; Tukvar, Khasias, 4000

\* Described from Dr. Horsfield's figures of the Java form, these being the only known illustrations of the larva and pupa of this common butterfly.

feet (Mr. Elwes); Naga Hills, August (Mr. Doherty); North Chin Hills, Upper Burma (Capt. Watson). Capt. A. M. Lang took it at "Naini Tal, 5000 feet, in September" (MS. Notes). Mr. W. Doherty records it from Kumaon as "common locally, at from 4000 to 5000 feet elevation. Taken also on the Dhoaj at 6500 feet" (J. As. Soc. Beng. 1886, 114). Mr. H. J. Elwes says it is "a very abundant species in tea-plantations and cleared land in Sikkim at 2000 to 7000 feet elevation, and also very numerous in some places both in the N.W. Himalayas and in the Khasias, where I found it in the open grassy hills in great quantities. It occurs from April to November. I observed a curious horny appendage to the abdomen of the female; and which is perhaps analogous, if not identical in character with the pouch in the genus *Parnassius*. Some very fresh and apparently virgin females, which I took in the Khasias, had not this appendage as yet developed, and it will be interesting to have closer observations as to whether it is produced during coitus, as in *Parnassius*, or not" (Tr. Ent. Soc. 1888, 334). Mr. L. de Nicéville records it as "immensely common in Sikkim, and found from 2000 to 7000 feet elevation, and is certainly double, if not treble-brooded. The black, spiny larva may be seen in hundreds, in clusters, by every roadside from October throughout the winter, at which time they are in a dormant state. Birds do not seem to eat them, though they are most conspicuous, probably their compound spines are a sufficient protection. The larvæ appear to be polyphagous, eating any kind of weed" (Sikkim Gazetteer, 1894, 131). Col. C. H. E. Adamson says it is a "very local insect in Burma. In October, 1886, I found it very abundant near one village in the Bhamo district. I have since received it from the Chin Hills" (List, 1897, 17). Dr. N. Manders says it is "found not uncommonly in the Shan States, at an elevation of 5000 feet, but it is a local insect here" (Tr. Ent. Soc. 1890, 520). Capt. E. Y. Watson records it as "common in the Chin Hills, at from 3500 to 5000 feet elevation during the rains." (J. Bombay N. H. S. 1897, 652). Signor L. Fea took it in the Kharen Hills, at Puepali 900 to 1000 feet, in June and July, and at Cheba, in September and October.

The Fabrician type, and Donovan's figure, are recorded from China. Mr. J. H. Leech (Butt. of China, i. 14) records it from Moupin, E. Tibet; Western and Southern China.

FOOD PLANT AND HABITS OF LARVA.—Mr. A. Graham-Young says, in Kulu, "the larva feeds on the willow-leaved nettle (*Bæhmeria salicifolia*). Imago, July to September. Eggs deposited in September, and hatch in about twenty days. Length of young larva three to four lines, entirely black. When about three weeks old they moult and then hibernate, re-appearing in the following April. They moult again early in May, when they assume the red head. The larvæ generally feed on the upper branches of the plant, are gregarious and drop to the ground

when disturbed. Third moult early in June, about the middle of which month they suspend themselves by the tail near the bottom of the stems of the bushes, and there change to the pupa state. The imago appears in about fifteen days, in the first or second week in July. A few come out in August and September, but not in sufficient numbers to constitute a succession of broods. The imago is seldom found far from the food-plant, which grows near running water" (Proc. Zool. Soc. Lond. 1882, 243).

MALAYAN ALLIED SPECIES.—*Parèba Vestita*, de Nicéville, Journ. As. Soc. Bengal, 1895, p. 397. (*Acræa Vesta*, Snellen, Mid. Sumatra, Lep. p. 13, pl. 2, fig. 3, 4, 5, ♂ (1892). "Male and female. Upperside. Both wings differ from Himalayan, Assam, and Burmese *Vesta*, in having the ground-colour more ochreous (less tawny) and all the veins more heavily defined with black. *Forewing* with a broad costal black margin reaching the subcostal nervure: the outer margin has the black border nearly twice as broad, with the marginal series of spots of the ground-colour obsolete or entirely absent. *Hindwing* with the black margin much broader, with the yellow marginal spots very much smaller. Underside of both wings differ only in having all the veins more strongly defined with black." *Habitat*. Sumatra.—*Parèba Vestoides* (*Acræa Vesta*, Horsfield, Catal. Lep. Mus. E.I.C. pl. 3, fig. 21, *larva* (1829).—Male and female. Upperside. Ground-colour generally brighter ochreous than in the Sumatra species; the veins in both wings being broadly defined with black, especially in the forewing of the male. Forewing with black costal and outer border, and the marginal row of spots of the ground-colour similar in size to those in Burmese and Himalayan *Vesta*; the cell, discocellular, and discal zigzag black marks more or less prominently defined in the male, broader and duller and partly coalescent in the female. *Habitat*. Java.—"Larva feeds on a species of *Urtica* bearing the native name of Latungan, December" (Horsfield MS. Notes).

#### Genus TELCHINIA.

*Telchinia*, Hübner, Verz. bek. Schmett. p. 27 (1816). Moore, Catal. Lep. Mus. E.I.C. i. p. 135 (1857); *id.* Lep. of Ceylon, i. p. 65 (1881). de Nicéville, Butt. of India, i. p. 319 (1883). *Acræa* (sect. 4 *Telchinia*), Doubleday, Gen. D. Lep. i. p. 141 (1848).

IMAGO.—Male. *Forewing* narrow, elongatedly-triangular; costal margin slightly arched towards the end, apex slightly rounded; exterior margin oblique and slightly convex, even; posterior margin short; costal vein extending to fully two-thirds the margin; first subcostal branch emitted at a short distance before end of the cell, second branch at two-fifths beyond the end, third and fourth at about equal distances apart beyond the second; cell long, extending to more than half the wing; discocellulars extending very obliquely outward, upper very short, middle deeply

concave and almost angled in its middle, lower slightly concave; radials from the angles of discocellulars; middle median branch emitted at a short distance before lower end of the cell, lower median at one-half length of the cell; submedian slightly recurved. *Hindwing* small, short, broadly ovate; anterior margin straight; exterior margin very convex, even; inner margin free from the abdomen and not channelled to enclose it; costal vein extending to the apex; precostal vein bent outward near its end; first subcostal branch emitted at about half lower length of the cell; the cell long; discocellulars very oblique and long, upper concave, lower slightly concave, radial from their middle; the middle median branch emitted at a short distance before lower end of cell, lower branch from more than one-half before end of the cell; submedian and internal vein slightly recurved. *Body* slender; abdomen long; last segment of female furnished with a corneous anal pouch; palpi ascending, stout, finely pilose above, sparsely setose beneath, second joint projecting slightly beyond the head, third joint extremely short; forelegs short, slender; *fore tarsus of male* cylindrical, clothed with short spiny-scales; *fore tarsus of female* cylindrical, scaly; four jointed, second, third, and fourth joints together as long as the first, each with a terminal pair of sharp spines, the apical pair being forwardly projected; antennal club abruptly clavate; eyes naked.

LARVA.—“Cylindrical, slender; armed with six longitudinal rows of fine branched-spines.”

PUPA.—“Suspended perpendicularly. Long, slender, smooth, two lateral angles on the thorax; head quadrate” (Davidson and Aitken).

TYPE.—T. *Violæ*.

**TELCHINIA VIOLÆ** (Plate 388, fig. 1, 1a, *larva* and *pupa*, 1b, c, d, ♂, 1e, f, g, ♀).

*Papilio Violæ*, Fabricius, Syst. Ent. p. 560 (1775), Ent. Syst. iii. p. 164 (1793).

*Acræa Violæ*, Horsfield, Catal. Lep. Mus. E.I.C. pl. 8, fig. 2, 2a, *larva* and *pupa* (1829). Staudinger, Exot. Schmett. i. p. 85, pl. 33 (1886).

*Telchinia Violæ*, Doubleday, Gen. D. Lep. i. p. 142 (1848). Moore, Catal. Lep. Mus. E.I.C. i. p. 135, pl. 5, fig. 1, 1a, *larva* and *pupa* (1857), *id.* Lep. of Ceylon, i. p. 66, pl. 33, fig. 1, 1a, ♂ ♀, 1b, *larva* and *pupa* (1881). Butler, Catal. Fabr. Lep. Brit. Mus. p. 131 (1869). de Nicéville, Butt. of India, i. p. 320, fig. ♂ (1883).

*Pupilio Cephus*, Cramer, Pap. Exot. iv. pl. 298, fig. D. E. (1782). Sulzer, Gesch. Ins. pl. 15, fig. 2 (1776).

*Telchinia Cephea*, Hübner, Verz. bek. Schmett. p. 27 (1816).

IMAGO.—Male. Upperside. Both wings ochreous-red; cilia black. *Forewing* with a small black subbasal spot and an oblique broad bar within the cell and a larger broader discocellular bar; the subbasal spot sometimes absent; an upper discal oblique series of four small spots, a single spot inwardly below these in the



upper median interspace, and one sometimes in the lower median interspace, another also obliquely outward between the median and submedian veins, followed also by a smaller spot below the cell; costal margin generally black-speckled: exterior margin and up the veins for a short distance also black. *Hindwing* with two small black spots in middle of the cell, two at end of the cell, another on the costa above the inner cell-spot, and a curved discal series of five or six decreasing spots; all these spots being occasionally more or less obsolescent; beyond is a black marginal band traversed by a row of small pale ochreous, or whitish spots. *Underside*. Both wings paler, glossy ochreous-red, the disc of hindwing palest and almost yellow. *Forewing* with the black spots and marginal border as above, but less prominent, the marginal border inwardly-edged with yellowish-white. *Hindwing* with a basal cluster of five black-ringed yellowish-white spots, two costal black spots, three discoidal, and a discal outer-curved series of smaller spots; the outer marginal black band with prominent larger yellowish-white spots, this band also being inwardly-edged with yellowish-white. *Body*. Head, thorax, and base of abdomen above and beneath black, spotted with white; abdomen above and beneath ochreous, with slender segmental black bands; palpi ochreous-white, setæ beneath black; legs blackish above and dusky-ochreous or greyish-ochreous beneath; antennæ black.

*Female*. Upperside paler than in male, with the black markings broader, and the marginal band on hindwing with larger spots. Underside duller coloured than in male; black markings as on upperside, the outer marginal edging being paler.

Expanse ♂ 2 to  $2\frac{4}{10}$ , ♀  $2\frac{1}{10}$  to  $2\frac{5}{10}$  inches.

*LARVA*.—"Cylindrical, slender; armed with six longitudinal rows of fine branched-spines. Colour reddish-brown with an oily-gloss; much paler on the head, second and last segment; an unwholesome-looking insect, doubtless protected like the butterfly."

*PUPA*.—"Suspended perpendicularly. Long, slender, smooth; two lateral angles on the thorax; head quadrate; colour creamy-white, with broad longitudinal bars of purplish-black spotted with orange." (Davidson and Aitken, *J. Bombay N. H. S.* 1890, 268).

*HABITAT*.—India; Ceylon.

*FOOD-PLANT OF LARVA*.—"We found the larvæ in the Kanara District, Bombay, plentifully in July, August, and September, feeding on the wild passion-flower (*Modecca palmata*)" (Davidson and Aitken, *l.c.*)

*DISTRIBUTION AND HABITS*.—"It occurs in the moister tracts of Eastern Continental and throughout peninsular India and in Ceylon. Mr. L. de Nicéville has taken it commonly in Calcutta throughout the year. It is not uncommon in Sikkin, and Mr. E. T. Atkinson found it in the submontane districts of Kumaon, which is probably its western limit in the North. It is found in the moister parts of the

Peninsula on both Coasts. We have it from Malwan on the West Coast, and from Rajamundry on the East, and there are specimens in the Indian Museum, Calcutta, from Badrachallum, Madras City, Bangalore, and Trevandrum" (Butt. Ind. i. p. 321). "It is a butterfly of the Plains rather than of the Hills. I have seen only two or three properly authenticated Sikkim specimens. In the Western Duars at the foot of the Hills it is quite common. Mr. G. C. Dudgeon has taken specimens in Daling at 3000 feet elevation" (L. de Nicéville, Sikkim Gazetteer, 1894, 131). Col. C. Swinhoe records it from the Khasia Hills (Tr. Ent. Soc. 1893, 276). Capt. H. L. Chaumette says it is "extremely abundant at Saugor, though none were seen during the whole journey from Bombay; August to November. It flies close to the ground, not swiftly, but lazily, settling for a short time on a flower, moving afterwards to another, and so on. Also taken at Lucknow, Allahabad, and Calcutta." (Ent. Monthly Mag. 1865, 37). Major H. B. Hellard obtained it in the "Ramgurh District, Chota Nagpur, in November and December" (MS. Notes). Mr. W. C. Taylor records it as "very common at Khoorda, Orissa" (List, 1888, 3). Col. C. Swinhoe obtained it in "Bombay, in September, and Poona from January to April" (P. Z. S. 1885, 127); also at "Mhow in September" (*id.* 1886, 424). Mr. E. H. Aitken says it is "not very common in Bombay, but a few appear just before the hot season. I met with it at Mahableswar in March. It seems generally to be on a journey, going steadily in one direction with a feeble flight, but it will stop to sip a flower and is easily caught. I believe it is, like the *Danainæ*, offensive to birds and reptiles" (Journ. Bombay N. H. S. 1886, 129). "Common everywhere, in the North Kanara District of Bombay, but most abundant on grassy hills, from November to March, we have only reared it on the wild Passion-flower (*Modecca palmata*), but it must feed on something else during the dry season. This butterfly is certainly 'protected,' like the *Danainæ*, by an offensive smell and taste" (Messrs. Davidson and Aitken, *id.* 1896, 246). Mr. S. N. Ward obtained it, and reared the larva in Kanara. Dr. F. Day found it common at Koonoor (MS. Notes). Mr. G. F. Hampson records it from the Nilgiris (J. A. S. Beng. 1888, 352). Capt. E. Y. Watson obtained it in "Madras, being very common from March to August" (*id.* 1890, 266), and in Mysore, at Kadur in November, Nelamangala, January; common" (*id.* l.c. 1890, 2). Mr. H. S. Ferguson found it "common in Travancore, in the low country and up to 2000 feet in the Hills" (l.c. 1891, 7). In Ceylon, Mr. F. M. Mackwood records it as being "found generally in the plains and up to about 4000 feet. It is about all the year. Capt. Wade also found it common at Kandy." The late Dr. Thwaites reared the larvæ. It feeds on *Cucurbitacææ*. The figures on Plate 33 (Lep. Ceyl.) being copied from his drawings (Lep. Ceyl. i. 66). Of our illustrations of this species on Plate 388, fig. 1 is from Gen. Hardwicke's original drawings, No. 90, of the larva and pupa reared at Dumdum, near Calcutta, in

March; fig. 1a, larva and pupa, is from Mr. Ward's Kanara drawings; figs. 1b, c, d, ♂, and 1e, f, g, ♀ imago.

### Sub-family PSEUDERGOLINÆ.

*Pseudergolina*,\* Jordan, Nov. Zool. v. p. 386 (1898).

#### CHARACTERS OF THE PSEUDERGOLINÆ.

IMAGO.—Wings moderately small, rather short. *Forewing* subtriangular; exterior margin slightly oblique, scalloped and obtusely angulated outward below the apex; costal vein stout, normal; first and second subcostal veinlets emitted before end of the cell; the cell broad, rather short, closed by a very slender lower discocellular veinlet. *Hindwing* short, triangular; exterior margin convex, scalloped; abdominal margin long, anal angle obtusely pointed; cell broad, closed. *Body* moderately stout; palpi extending more than half its length beyond the head; compactly clothed with appressed hairy-scales; *forelegs of male* slender, tibia and tarsus of nearly equal length, clothed with long fine hairs to the tip; *forelegs of female* perfect, more slender, scaled, and with a few fine very short lateral hairs; tarsus with the four terminal joints, together, of equal length of the first, lateral spines very slender, *fifth joint* furnished with a pair of forward projected curved spurs, slender pulvillus, and stoutish paronychialia; antennal club gradually cylindrical; eyes naked.

LARVA.—Cylindrical. Head armed with two long vertically-divergent spined horns; a dorsal short pointed tubercle on fifth segment, and two erect pointed tubercles on eleventh segment.

PUPA.—Suspended by tail, but in a horizontal position. Rather stout and broad; with an anal upward protuberance; dorsum keeled and ending in a rounded protuberance projecting over the waist; thorax posteriorly protuberant; head with two short divergent points; thorax, wing-cases and base of abdomen laterally broad and angular.

#### Genus PSEUDERGOLIS.

*Pseudergolis*, Felder, Reise Nov. Lep. iii. p. 404 (1867). de Nicéville, Butt. of India, ii. p. 119 (1886); Journ. Asiatic Soc. Bengal, 1900, p. 152.

IMAGO.—Male. *Forewing* subtriangular, rather short; costa regularly arched,

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\* The discovery of the characteristic feature of the genus *Pseudergolis*, namely, the perfect forelegs of the female, thus separating it from all other known sub-families of the Nymphalidæ, is due to the previous researches of Mr. W. Doherty. (See Doherty, Journ. As. Soc. Bengal, 1889, p. 126, and Moore, Lep. Ind. i. p. 220 (1895).

apex obtusely pointed, exterior margin slightly oblique and slightly scalloped, and broadly but obtusely angulated outward below the apex, posterior margin slightly recurved; costal vein stout, extending to beyond half the margin; first subcostal branch emitted at about one-fifth before end of the cell, second branch immediately before the end, third branch at nearly one-third beyond the end; cell broad, rather short; upper discocellular extremely short, middle discocellular inwardly-oblique and slightly concave posteriorly, lower discocellular oblique, and very slender; two upper median veinlets from lower end of cell, lower median from two-fifths before the end; submedian slightly recurved. *Hindwing* short, triangular; anterior margin arched from the base, apex obtuse, exterior margin obliquely-convex, and slightly scalloped, abdominal margin long, anal angle obtusely pointed; precostal vein short, almost straight; costal vein extending to the apex; subcostal branch at three-fourths from upper base of cell; upper discocellular emitted at some distance from base of subcostal branch and curved outwards, lower discocellular outwardly-oblique, recurved, very slender; cell broad; two upper median veinlets from lower end of cell, middle median from opposite base of upper discocellular; submedian vein straight, inner recurved. *Body* moderately stout; palpi porrect, extending more than half beyond the head, compactly clothed with appressed hairy-scales, which are more laxly disposed on the middle joint above; *forelegs of male* slender, tibiae and tarsi clothed with long fine hairs to the tip, tibia and tarsus of nearly equal length; femora beneath clothed with similar fine hairs; *forelegs of female perfect*, more slender, clothed with scales and a few fine very short lateral hairs; tarsus with the four terminal joints, together, as long as the first, lateral pair of spines very slender, fifth joint with a forward-projected pair of curved spurs, slender pulvillus and stoutish paronychia; antennæ with a gradually well-formed cylindrical club; eyes naked.

LARVA.—[Wedah]. Cylindrical. Head armed with two long vertically-divergent very finely-spined horns; a dorsal short fleshy pointed-tubercle on the fifth segment, and two fleshy sharp-pointed erect tubercles on the eleventh segment.

PUPA.—Suspended by tail, but in a horizontal position; rather stout and broad; anal end obtusely protruded upward; dorsum keeled and ending in a rounded protuberance projecting over the waist; thorax posteriorly protuberant; head with two short divergent points in front; thorax, wing-cases posteriorly, and base of abdomen laterally broad and angular.

TYPE.—*P. Avesta*.

MIMICRY.—The two species of *Pseuderyolis*, the only known genus in this sub-family, are both excellent mimics of *Ergolis*. The type species, *P. Avesta*, is a very fair mimic of *Ergolis Celebensis*, and also an excellent one of the common *Precis intermedia*. The male of *P. Wedah* is most like *Ergolis Ariadne* in its colour and

distinctness of markings, whereas the female (of *Wedah*) in its paler colour, is more like *E. Merione*.

Another interesting feature is the very fair mimetic resemblance of *P. Wedah*, on the upperside of the wings, to the female of *Rohana Parisatis*, occurring in the same localities,—and, further—the larva of *P. Wedah*, as figured on our Plate 389, is also very similar, in appearance, to the larva of the genus *Rohana*, the S. Indian and Ceylon species of which (*R. Camiba*) is also figured on our Plate 194, the pupa, also, of this genus, being somewhat the shape of that of *P. Wedah*.

**PSEUDERGOLIS WEDAH** (Plate 389, fig. 1, larva and pupa, 1a, b, c, d, ♂ ♀).

*Ariadne Wedah*, Kollar, Hügel's Kaschmir, iv. pt. 2, p. 437 (1844).

*Pseudergolis Wedah*, Moore, Proc. Zool. Soc. Lond. 1882, p. 240. de Nicéville, Butt. of India, ii. p. 126, pl. 23, fig. 109, ♂ (1886). Leech, Butt. of China, i. p. 275 (1893). Mackinnon, Journ.

Bombay Nat. Hist. Soc. 1897, p. 371, pl. U, figs. 9a—f, larva and pupæ.

*Precis Veda*, Kirby, Syn. Catal. D. Lep. p. 191 (1871).

*Precis Hara*, Moore, Catal. Lep. Mus. E. I. Company, i. p. 143, pl. 3a, fig. 1, ♂ (1857).

IMAGO.—Male. Upperside golden-brown or rich brownish-ochreous, darkest on the outer margins; cilia black, alternated with white. *Forewing* with two black slender bars crossing middle of the cell and two similar bars enclosing the discocellulars; a transverse inner-discal slender lunulated almost erect band, a somewhat recurved outer-discal and a submarginal similar band, the two latter medially interspaced by a row of four or five black dots. *Hindwing* with four black similarly disposed cell-bars, but which are more slender and nearer together; a transverse inner and outer-discal less sinuous but slightly curved band, and a submarginal more sinuous curved band, the two latter being also interspaced by a medial row of five dots. Underside greyish-brown. Both wings with markings, as on upperside, dark brown, the two inner-discal bands broader, and the outer margins diffusely dark brown; the interspaces of the cell-marks and bordering area of outer rows of dots slightly suffused with ochreous, and all the markings are more or less slightly edged with glossy pale violet; on the hindwing is a short subbasal brown streak ascending between the subcostal and costal vein.

Female. Upperside much paler; markings the same, but less prominent. Underside also much paler, and the markings less prominent than in the male. *Body* above golden-brown; beneath, palpi, and legs greyish-brown; antennæ black above, beneath and tip ochreous.

Expanse, ♂ 2 to  $2\frac{6}{10}$ , ♀  $2\frac{2}{10}$  to  $2\frac{6}{10}$  inches.

LARVA.—Cylindrical. Length  $1\frac{3}{8}$  inch. Head armed with two long vertically divergent very finely-spined horns, which are yellowish green, and have shining

black tips; a dorsal short fleshy pointed-tubercle on the fifth segment, and two fleshy sharp-pointed erect black spines on the eleventh segment, the base of the spines being pale greyish-blue. Colour bright dark green; all the segments except the head minutely spotted with white, these spots being arranged in two transverse rows on each segment; the line dividing the dorsal from the ventral surface is creamy-white.

PUPA.—Suspended by the tail, but in a horizontal position. Rather stout and broad; anal end with an upward obtuse protuberance; dorsum straight, slightly ascending forward, keeled, and ending anteriorly in a rounded protuberance projecting over a depressed waist; the thorax being posteriorly protuberant and oblique in front; head with two short divergent points in front; thorax laterally broad and angular in the middle; wing-cases posteriorly, and abdomen basally, also laterally broad and angular. Colour pale green with darker sectional markings. (Described from Mr. P. W. Mackinnon's original drawings.)

HABITAT.—W. and E. Himalayas; Assam; Silhet, Khasias; Burma; W. and C. China.

DISTRIBUTION AND HABITS.—“In the N.W. Himalayas and in Sikkim I have always met with this species near water. It occurs at Shillong in May; Mr. H. M. Parish has taken it in the Chittagong Hill Tracts in November; Capt. C. T. Bingham has taken it in the Donat Range, Upper Tenasserim. It is not a rare species where it occurs, and has a very pretty soaring flight, and usually settles with wide outspread wings on the upper surface of a leaf” (de Nicéville, Butt. Ind. ii. 120). Capt. A. M. Lang records it as being found in the Western Himalayas, generally on the banks of streams (P. Z. S. 1865, 495). Major H. B. Hellard obtained it at “Simla and Masuri, from June to October” (MS. Notes). Mr. L. de Nicéville says, “I have only seen it near water. Each insect seems to frequent a limited space, and flies backwards and forwards within this space, occasionally settling on overhanging bushes, &c., but starting off in pursuit, and doing battle with any intruder, especially one of its own species, that dares to invade its domain. It soon becomes shattered, and no wonder, considering its pugnacious temperament” (Indian Agric., January, 1880). Mr. W. Doherty took it in the “Sarju, Kali, and Gori Valleys, 2000 to 5500 feet elevation, Kumaon” (J. As. Soc. Bengal, 1886, 123). Mr. P. W. Mackinnon, to whom we owe the discovery of the larva and pupa, of which we reproduce his published figures on our Plate 389, records it as “very common during the summer in and near Masuri, where it is probably triple-brooded, but is not found in the Dun. The larva feeds on the Siar, *Debregeasia bicolor*, Nat. Order *Urticaceæ*, on which I found it in August. The leaf of the plant is much crinkled, as also is the skin of the larva, so it is difficult to see the latter even in bright sunshine” (J. Bombay N. H. S. 1895, 371). Mr. H. J. Elwes says that,

in Sikkim, it is "common from 2000 to 6000 feet elevation between March and November. I have always found it in the rains most abundant in second-growth jungle and open places, such as the road between Lopchu and Pashok" (Trans. Ent. Soc. 1888, 348). Mr. L. de Nicéville records it as "not uncommon in Sikkim at the level of the Terai to about 6000 feet, from March to November. In the Western Himalayas it occurs almost entirely in the beds of hill streams, in Sikkim it is also found there commonly, less frequently in forests" (Sikkim Gazetteer, 1894, 139). Col. C. Swinhoe records it from the Khasias (Tr. Ent. Soc. 1893, 281.) Col. C. H. E. Adamson "took this insect in September, October, and February in Moulmain and Arakan, and one specimen at Aloungdan Kathapa in Upper Burma, in February. It is an uncommon insect, and I have always seen it settle on the ground with its wings outstretched; when disturbed it flies away rapidly, returning after a time to the same spot" (List Burmese Butt. 1897, 21). Dr. N. Manders found it "not rare in the Shan States, Burma, and generally seen in jungly places near water" (Tr. Ent. Soc. 1890, 522). Specimens are recorded from "Tavoy and Ponekai" (J. As. Soc. Bengal, 1887, 420). Signor L. Fea took it in Bhamo, and at Cabopa in October and November.

MALAY SPECIES.—*Pseuderyolis Arista*, Felder, Reise Novara, Lep. iii. p. 402, ♂ (1867). Doherty, Journ. As. Soc. Bengal, 1889, p. 126. Holland, Proc. Bost. Soc. Nat. Hist. 1890, p. 63, ♀. *Habitat.* Menado, Minahasa, Celebes.

### Sub-family CALINAGINÆ.

*Calinaginæ*, Moore, Lep. Indica, ii. p. 220 (1895). Jordan, Nov. Zool. v. p. 386 (1898).

#### CHARACTERS OF THE CALINAGINÆ.

IMAGO.—*Forewing* elongated, triangulate; apex broadly rounded, posterior angle rounded; veins stout; cell long, rather broad, closed. *Hindwings* elongated, somewhat quadrate, rather broad; veins stout; cell large, broad across the middle, with a slightly perceptible (under the microscope) narrow basal, or prædiscoidal cell,\* which is formed by the peculiar conformation of the costal, subcostal, and median veins in conjunction with an interno-costal veiolet. *Thorax* large, densely clothed with hairs, woolly in front; abdomen long; rather stout, sparsely clothed with very short hairs. Eyes densely hairy. Antennæ short, stout, gradually thickening to the tip, not clubbed. Palpi porrect, short, clothed with fine hairs, apical joint cylindrical. *Forelegs of male* short, pectoral, clothed with fine hairs. *Forelegs of female* perfect, somewhat longer and slender, much less hairy, the hairs on tibiæ and

\* First discovered in this sub-family, by Mr. J. Watson (see Memoirs and Proc. Manchester Lit. and Phil. Society, 1899, p. 13).

tarsi more bristly, tarsus five jointed, each with a lateral short spine, the terminal joint furnished with a pair of small curved claws, paronychialia, and a pulvillus.

LARVA and pupa unknown.

DISTRIBUTION.—The habitat of the only known genus (*Calinaga*) of this sub-family, is in the Western and Eastern Himalayas, Upper Burma, Upper Siam, and Western and Central China.

### Genus CALINAGA.

*Calinaga*, Moore, Catal. Lep. Mus. East Ind. Company, i. p. 102 (1857). Lucas, Ann. Soc. Ent. France, 1884, p. 86. de Nicéville, Butt. of India, etc., ii. p. 142 (1886); *id.* Journ. As. Soc. Bengal, 1900, p. 150. Staudinger and Schatz, Exot. Schmett. ii. p. 134 (1887). Leech, Butt. of China, etc., i. p. 117 (1892). Jordan, Nov. Zool. v. p. 386 (1898). Watson, Mem. Manchester, Lit. and Phil. Soc. 1899, pp. 123.

IMAGO.—*Forewing* elongated, triangulate; anterior margin slightly arched, apex broadly rounded; exterior margin about half the length of the anterior, oblique, very slightly uneven; posterior margin recurved, two-thirds the length of the anterior, angle rounded. Veins stout, costal vein extending to fully two-thirds of the margin; subcostal vein well separated from the costal, its first branch arising at fully two-fifths from the base or one-fifth before end of the cell, second branch at a short distance before end of the cell, third branch at two-fifths beyond the cell, fourth at about three-fifths, the fifth extending to below the apex; cell extending to more than half length of the wing, rather broad; upper discocellular veinlet extremely short, middle and lower discocellular concave, the middle shortest; median veinlets equidistant apart, middle veinlet emitted at some distance before lower end of the cell; submedian vein nearly straight. *Hindwing* elongated, somewhat quadrate, rather broad; anterior margin lobately-convex at its base, thence quite straight and extending beyond the posterior angle of the forewing, apex rounded, exterior margin obliquely convex and somewhat angular in the middle, abdominal margin lobately-convex at the base, thence nearly straight, the anal angle being convex; precostal vein rather indistinct, curved inward, arising at some distance from above the base of subcostal; costal vein arched near the base, then straight, extending to costal margin at three-fourths of the wing; subcostal vein very straight to two-fifths of the wing, whence the first branch starts slightly upward and extends to the apex, second subcostal branch starting at a very short distance from the first; discocellulars very oblique, rather long, upper shortest and slightly concave, lower slightly convex; cell large, broad across the middle, extending to half the wing; basal cell\* (formed by the peculiar conformation of the costal, subcostal and median veins in conjunction with an interno-costal veinlet) very narrow, and perceptible

\* See Watson, l.c. p. 13.



only under the microscope; middle median branch emitted at a very short distance before lower end of the cell, upper branch much arched, lower branch at a little beyond one-fourth before the end; submedian vein straight; inner vein recurved. Head small, with a somewhat long frontal tuft; eyes densely hairy; thorax large, densely clothed with fine long hairs, woolly in front; abdomen long, rather stout, glossy, sparsely clothed with very fine short hairs; antennæ short, stout, gradually thickening to the tip, articulations prominent; palpi porrected, short, ascending to level of the middle of the eyes, covered with fine hairs and basally clothed with fine long hairs beneath, apical joint cylindrically-oval and compactly clothed with short fine hairs; *forelegs* short, pectoral, femur of *male* clothed with fine long hairs; tibia and tarsus hairy; tarsus two-thirds the length of tibia, single-jointed, unarmed; forelegs of *female* somewhat longer and more slender, much less hairy, the hairs shorter, finer, especially those on the tibia and tarsus, which are more bristly; the tarsus thicker, five jointed, first joint nearly as long as the other four altogether, the latter joints each with a short, lateral, very fine and delicate spine, and the terminal joint furnished with a pair of small, rather long, prominent, stoutish, forward-projected claws, which latter are much curved and closely approximate at their base; below these claws is a pair of paronychialia, and a pulvillus.

TYPE.—C. Buddha.

HABITS.—As observed in the Western Himalayas, *Calinaga Buddha* “frequents the banks of heavily wooded streams, from 3500 to 6000 feet elevation. It is purely a forest insect, and generally occurs from March to July. It is very fond of settling on wet sand or gravel; when disturbed it flies off with a Papilio-like flight, and is very strong on the wing” (A. E. Young).

MIMICRY.—The species of *Calinaga* are, probably, mimetic. *C. Buddha*, *Gautama* and *Brahma* resembling the common Euploëine butterfly *Tirumala Limniace*, and *C. Sudassana* the *Caluga Tytia*.

#### CALINAGA BUDDHA (Plate 390, figs. 1, 1a, b, ♂ ♀).

*Calinaga Buddha*, Moore, Catal. Lep. Mus. East India Company, i. p. 163, pl. 3a, fig. 5, ♂ (1857).

? Staudinger, Exot. Schmett. i. p. 138, pl. 47, ♂.

*Calinaga Buddha* (part) de Nicéville, Butt. of India, etc. ii. p. 143 (1886).

IMAGO.—Male and female. Upperside fuliginous-black; veins black. *Forewing* with a transverse submarginal row of somewhat creamy-white or greyish-white rounded spots, a discal parallel row of irregular-shaped longitudinal streaks, which commence narrowly between the subcostals and widen posteriorly to above the submedian, in which latter interspace the streak is much elongated, extending to the base of the interspace and is longitudinally divided by a slender black line; two longi-

tudinal narrow white streaks outside the discocellulars ; interspace of the cell with a widening basal white streak and a broad irregular-shaped patch beyond. *Hindwing* with a transverse submarginal row of five white oval spots, a medial-discal row of either four, five, or sometimes six spots, the upper three being the largest and more elongate, these being preceded by an inner-discal upper row of smaller spots ; cell interspace almost entirely white ; the abdominal margin also broadly white and tinged towards the anal angle with very pale ochreous-yellow. Underside. *Forewing* with the dark ground-colour paler, the apex tinged with pale ochreous-brown ; veins black ; the markings as above, white ; the cell portions being more or less united or partly medially-divided by a narrow oblique blackish irregular bar. *Hindwing*. Ground-colour pale dull ochreous-brown, palest basally ; the veins black ; markings as above, white, but much less prominent ; cell area entirely white. Thorax clothed with deep ferruginous hairs, brightest in front ; abdomen shiny black, segments fringed with very minute fine white hairs ; front of head, palpi, antennæ and legs black ; eyes clothed with black hairs.

Expanse, ♂ ♀ 3 $\frac{1}{10}$  to 4 inches.

HABITAT.—Western Himalayas.

DISTRIBUTION.—Mr. A. Graham Young obtained “ five specimens at Kujiah near Dalhousie, at 6000 feet elevation, in May, 1867, one specimen in Kulu at 3600 feet, in March, 1871, one at 3500 feet in March, 1872, and one at 3700 feet in May, 1885. In July, 1872, three were seen in Kulu at 4500 feet, flying together, and on three different dates in May, 1885, three more were seen ” (Butt. Ind. ii. 143). Mr. H. J. Elwes has a female, taken in Chumba, Western Himalayas. Col. C. Swinhoe has received several specimens taken by Mr. Young, in Kulu.

HABITS.—According to the observations of Mr. A. G. Young, “ it is not very rare in the Kulu Valley, W. Himalayas, frequenting the banks of heavily wooded streams from 3500 to under 6000 feet elevation above the sea, never higher than that. It is purely a forest insect, never found amongst mere brushwood, but always amongst trees, and occurs generally from about March 25th to May 20th. Once only three were seen together in July, 1872. It is very fond of settling on wet sand or gravel ; when disturbed it flies off with a strong *Papilio*-like flight, and is very strong on the wing. His native collector reports that last year (1899) he saw over twenty specimens, but caught only five. In Kulu it is very local. Mr. Young knows of two spots only where it occurs ” (de Nicéville, Journ. As. Soc. Bengal, 1900, 154).

**CALINAGA GAUTAMA** (Plate 390, figs. 2, 2a, ♂ ♀).

*Calinaga Buddha*, de Nicéville, Butt. of India, etc. ii. front plate, fig. 122, ♂.

Male and female. Upperside. Ground-colour blacker than in typical *C. Buddha* ;

with greyish-white similarly disposed markings. *Forewing* with the submarginal row of spots smaller and more triangular in shape, the three spots of the discal series in the discoidal interspaces also smaller and shorter, the end cell-spot narrower and recurved. *Hindwing* with the rows of spots somewhat smaller, the outer row more triangular in shape, the white area within the cell not extended outwardly to the veins; the dark-ground colour extending to above anal angle. Under-side. *Forewing* with the greyish-white markings as on the upperside. *Hindwing* deeper ochreous-brown than in *C. Buddha*, the white markings as on upperside.

Expanse ♂ ♀  $3\frac{8}{10}$  to 4 inches.

HABITAT.—Eastern Himalayas.

DISTRIBUTION.—“A rare species, which does not occur in British Sikkim, but has been brought from the Central part of Native Sikkim by Mr. Otto Möller’s collectors” (H. J. Elwes, Tr. Ent. Soc. 1888, 351). Mr. Möller’s collection, when in London for disposal, contained nine males. Mr. L. de Nicéville says it is “one of the rarest of the Sikkim butterflies, and has never, I believe, been caught by a European in that region. It appears to be single-brooded and to occur in the spring in Native Sikkim” (Sikkim Gaz. 1894, 140).

**CALINAGA BRAHMA** (Plate 391, fig. 1, 1a, ♂ ♀).

*Calinaga Brahma*, Butler, Annals and Mag. of Nat. Hist. xvi. p. 309 (1885).

Male and female. Upperside fuliginous-black. Differs from *C. Gautama* in the markings being narrower, duller greyish-white, and less prominently defined. On the *forewing*, the spots outwardly bordering the discocellulars are absent. On the *hindwing*, the spots are also narrower, and the spots outwardly bordering the discocellulars obsolescent; the whitish cell-area is longitudinally narrow and medially restricted, and is traversed from its outer end by a fine line of dark scales; the whitish abdominal marginal-area is also more basally restricted. Underside. *Forewing*. Ground-colour blacker than in *C. Gautama*; markings as above, whiter and more distinct. *Hindwing* deeper ochreous-brown; the white markings as above; exterior veins slightly edged along each side with whitish scales in the male, less so in the female.

Expanse, ♂  $3\frac{8}{10}$ , ♀  $4\frac{3}{10}$  inches.

HABITAT.—Near Assam.

Originally described by Mr. A. G. Butler from “two males and one female, obtained by Dr. G. Watt near Assam” (l.c. 309). Mr. H. J. Elwes has noted that these specimens were probably collected by Dr. Watt in the Naga Hills, on the march from Manipur to Kohima, in the spring of 1884.

Our illustrations of this species, on Plate 391, are from the male and female type specimens in the British Museum.

**CALINAGA SUDASSANA** (Plate 391, fig. 2, 2a, ♂).

*Calinaga Sudassana*, Melvill, Trans. Ent. Soc. Lond. 1893, p. 121, pl. 7, fig. 1, 2, ♂. Watson, Mem. Manchester Lit. and Phil. Soc. 1899, pl. 4, fig. 2, 2a, ♂.

Male. Upperside fuliginous-black; veins black. *Forewing* with a dull greyish-white outer marginal lower row and a submarginal entire row of rounded spots; a discal series of spots, of which the three upper are small, the two next in the median interspaces longer, the two lower forming elongated streaks, and extending together to the base of the wing, these latter being also slightly coalescent with the two lower spots of the inner submarginal series; cell-area with a broad basal grey streak and a duplex broad patch beyond. *Hindwing* with the ground-colour of the outer area deep fuliginous-brown; a submarginal row of five whitish small round spots, an upper discal and an inner-discal row of elongated streaks, the two latter series being slightly coalescent, longitudinally, and also with the corresponding submarginal spots; base of costal border, the cell-area and abdominal margin broadly from the median vein to the middle whitish, the lower abdominal area to the anal angle being bright yellowish-ochreous.

Underside. *Forewing*. Dark ground-colour paler; veins black; the greyish-white markings as above, the outer marginal row being obsolescent. *Hindwing*. Ground-colour dark ochreous-brown; veins black; markings similar to above, but dull ochreous-white, the anal angle being broadly brownish-ochreous. Thorax rich red; abdomen black.

Expanse, ♂ 4 to  $4\frac{2}{10}$  inches.

HABITAT.—Upper Burma; Upper Siam.

DISTRIBUTION.—The type specimens, three males, were obtained by Mr. R. Roberts, C.E., in the mountainous regions about 100 miles N.W. of Chieng Mai, Siam (Melvill, l.c.). Three specimens were taken by Capt. Longe, R.E., in the Northern Shan States, at Kunlon, on the Chinese frontier East of Bhamo (Capt. E. Y. Watson, Note). Mr. L. de Nicéville says, "I have specimens from the Kunlon Ferry, Salween River, N. Shan States, taken on March 11th, 1895, and Mr. J. A. Hauxwell obtained three males on the Toungoo Hills at about 2000 to 2500 feet elevation, also in March" (Journ. As. Soc. Beng. 1899, 332). Three specimens taken by Mr. Hauxwell in Toungoo, are in Mr. H. Grose-Smith's collection.

MIMICRY.—This species is an excellent mimic of the Euploëine butterfly *Caduga Tytia*, occurring in the same localities.

CHINESE SPECIES.—*Calinaga Davidis*, Oberthür, Études Ent. iv. p. 107 (1879).

C. Buddha, *id.* l.c. vi. p. 11, pl. 8, fig. 6, ♂ (1881). Leech, Butt. of China, etc., i. p. 118 (1894). *Habitat.* Moupin, W. China; Chang Yang, C. China.—*Calinaga Saka* (C. Buddha, Leech, l.c. p. 118 (part), pl. 20, fig. 1, ♂ (1894). *Habitat.* Wassu-kow; Chou-pin-Sa, W. China.—*Calinaga Lhatso*, Oberthür, Études Ent. xviii. p. 13, pl. 7, fig. 81. Leech, l.c. ii. p. 652 (1894). *Habitat.* Tsa-kou, E. Tibet.—*Calinaga Cereyon*, de Nicéville, Journ. As. Soc. Bengal, 1897, p. 550, pl. 2, fig. 9, ♂. *Habitat.* Ta-Tsien-Lou, W. China.

### Sub-family LIBYTHEINÆ.

*Libytheides*, Boisduval, Ind. Méth. Eur. Lép. p. 23 (1840).

*Libytheidæ*, Duponchel, Catal. Méth. Lép. Eur. p. 8 (1844). Westwood, Gen. D. Lep. ii. p. 412 (1851). Kirby, Man. Eur. Butt. p. 82 (1863). Wallace, Trans. Ent. Soc. Lond. 1869, p. 334. Lang, Eur. Butt. i. p. 151 (1884). Doherty, Journ. As. Soc. Bengal, 1886, p. 110. Kirby, Allen's Nat. Hist. Butt. ii. p. 1 (1896). Grote, Tr. Ent. Soc. Lond. 1897, p. 340.

*Libytheina*, Bates, Journ. of Entom. i. p. 220 (1861); *id.* ii. p. 176 (1864). Kirby, Syst. Catal. D. Lep. p. 282 (1871). Moore, Lep. of Ceylon, i. p. 67 (1881). de Nicéville, Butt. of India, ii. p. 299 (1886).

*Libytheine*, Scudder, Butt. U. S. p. 749 (1889). Moore, Lep. Indica, i. p. 2 (1890). Jordan, Nov. Zool. v. p. 386 (1898).

*Hypti*, Hübner (Scudder, Syst. Rev. Amer. Butt. p. 28 (1872).

### CHARACTERS OF THE LIBYTHEINE.

IMAGO.—Male and female of moderate size. *Forewing* subtriangular; costa arched; exterior margin strongly angulated outward below the apex, obliquely concave below the angle and slightly scalloped; cell closed. *Hindwing* short, broad, somewhat quadrate or irregularly ovate, exterior margin scalloped; cell closed. *Body* robust; palpi much elongated, porrected horizontally, and forming a long conical beak, not compressed, densely clothed with short hairs; antennæ short, gradually incrassated to the tip; eyes naked; forelegs short, small, tarsus of the *male* brush-like, exarticulate, of the *female* clothed with short spiny scales, articulated, spined beneath, last joint furnished with two minute curved claws, paronychialia, and pulvillus.

LARVA.—Subcylindrical, rather slender, pubescent, unarmed.

PUPA.—Suspended by the tail. Short, not angulated; head broad.

EGG.—“Ampulliform; shaped like a soda-water bottle; twice as high as wide, forming a short neck or stalk close to the apex; radiate, with strong and anastomosing ribs” (Doherty).

DISTRIBUTION AND HABITS.—“The history of the transformations of these butterflies are imperfectly known. In temperate regions it would appear that there is more than one brood annually. Mr. Wallace (l.c.) says they are of world-wide distribution,

and frequent open grounds, plains, river banks, and sea-shores, rather than of the virgin forest. The species, in their activity of motions, resemble the lesser *Nymphalinae*." Mr. de Nicéville (l.c. 299) says, "In India, I have almost exclusively found them near water, and Major Marshall informs me that he has more usually seen them in forest glades." "They rest with closed wings, usually at the end of a dead branch or stick, when they are very difficult to see, unless they have been actually observed to settle (*id.* J. Bombay N. H. S. 1890, 207). In Japan, according to the observations of Mr. H. Pryer, "There is only one annual brood of *L. Lepita*. It emerges from the pupa in July, and lives until the following May. It retires to its hybernaculum soon after its emergence, and remains quiescent until the following March, when it is awakened by the first warm day, and may then be seen depositing its eggs on the unopened buds of the *Celtis*" (Rhop. Nippon, p. 21).

#### Genus LIBYTHEA.

*Libythea*, Fabricius, Illiger's Mag. vi. p. 284 (1807). Latreille, Consil. p. 440 (1810). Godart, Enc. Meth. ix. p. 10 (1819). Duponchel, Catal. Lep. Eur. p. 8 (1844). Westwood, Gen. D. Lep. ii. p. 412 (1851). Kirby, Catal. D. Lep. p. 282 (1871). Crotch, Cist. Ent. i. p. 66 (1872). Moore, Lep. of Ceylon, i. p. 67 (1881). de Nicéville, Butt. of India, etc. ii. p. 300 (1886). Leech, Butt. of China, etc. i. p. 286 (1892).

*Hecaterge*, Ochsenheimer, Schmett. Eur. iv. p. 32 (1816). Hübner, Verz. Schmett. p. 100 (1816).

*Chilea*, Billberg, Enum. Ins. p. 79 (1820).

*Hypatus*, Hübner; Catal. Franck, p. 85 (1825).

IMAGO.—Male. *Forewing* subtriangular; costa arched from the base, apex acute, exterior margin strongly angulated outward below the apex, concave and slightly scalloped below the angle, posterior margin short, straight; costal vein extending to about one half the margin; first and second subcostal branches emitted at some distance before end of the cell, third branch at fully two-fifths beyond, fourth at three-fifths and ending at the apex, fifth ending below the apex; cell large, broad, extending to middle of the wing; upper discocellular short and slightly oblique, middle and lower discocellulars of nearly equal length, slender and concave; radials from their angles; middle median branch emitted at some distance before lower end of the cell; submedian recurved. *Hindwing* short, broad, somewhat quadrate; anterior margin abruptly and broadly lobed from the base and slightly raised and rounded at the apex, exterior margin slightly concave below the apex and extending obliquely outward to end of lower subcostal, thence convexly inward and sharply scalloped to anal angle; abdominal margin long; precostal vein long, curved outwards; costal vein extending to below the apex, subcostal arising opposite the precostal; lower subcostal branch emitted at one-third before upper end of the cell; discocellulars slender, outwardly oblique and concave, upper

shortest; middle median branch emitted from close to lower end of the cell, upper median much curved beyond the cell. *Body* robust, rather short, thorax thickly clothed with soft woolly hairs; head tufted in front; eyes prominent, naked; palpi much elongated, porrected horizontally, not compressed, thickly clothed to the tip with moderately long fine hairs, the inner edge of both uniting together so as to form, conjointly, a long conical beak, obtuse at the tip, second joint oval, third joint greatly elongated and slender; antennæ rather short, straight, articulations indistinct, gradually thickening from the base to the tip, which is obtuse. *Forelegs of male* very small, brush-like, densely clothed with fine silky hairs; tarsus shorter than the tibia, cylindrical, exarticulate and destitute of claws. *Forelegs of female* much longer than in male, femur and tibia of about equal length, tarsus longer, slender; femur loosely scaled and with long fine curved hairs beneath; tibia densely clothed with lax spiny scales; tarsus clothed with spiny scales intermixed beneath with short spiny hairs, the hairs being stoutest on the anterior ends of the joints, the latter with two terminal stouter spines; the last joint armed with two minute distinct curved claws, narrow paronychia and broader pulvillus.

LARVA.—Rather slender, sub-cylindrical, pubescent.

PUPA.—Suspended by the tail. Short, not angulated; head broad.

EGG.—“Ampulliform; shaped like a soda-water bottle, twice as high as wide, forming a short neck or stalk close to the apex, radiate, with strong and anastomosing ribs” (Doherty, Journ. As. Soc. Beng. 1886, 110).

TYPE.—L. Celtis.

**LIBYTHEA SANGUINALIS** (Plate 332, fig. 1, 1a, b, c, d, e, f, g, ♂ ♀).

*Libythea Myrrha*, var. *Sanguinalis*, Fruhstorfer, Berlin, Ent. Zeit. 1898, p. 169.

*Libythea Myrrha*, Gray, Lep. Ins. Nepal, p. 15, pl. 12, fig. 4 (1846). Moore, Proc. Zool. Soc. 1878, p. 832. Swinhoe, P. Z. S. 1885, p. 130. Distant, Rhop. Malayana, p. 448, pl. 42, fig. 2 (1886). de Nicéville, Butt. of India, etc. ii. p. 303, (1886). Læsch, Butt. of China, i. p. 287 (1893).

IMAGO.—Male. Upperside. Both wings deep vinous-brown, with ferruginous markings. *Forewing* with a ferruginous streak, commencing narrowly at the base of the cell and widening along both upper and lower sides of the median vein, from its base, to the middle of the disc, where it occupies the entire width of the upper and middle median interspace and the lower portion of the space above, the streak being, outwardly, broadly rounded and widest at the end of the cell, the cell portion being shaped just like a tent-peg, and very rarely shows traces of a few brown scales across from its indented angle; two subapical oblique spots, which are sometimes more or less paler or whitish, and are either quite separated, or narrowly joined together on the upper discoidal veinlet, each spot also being sometimes almost

divided into two by the veinlets; generally, a small diffused whitish spot is present at the extreme apex of the wing. *Hindwing* with a broad discal band, widening to and diffused at the abdominal margin, being well-defined outwardly and there generally more or less bent upward and inward in the subcostal interspace; a small pale ferruginous spot sometimes also present on middle of the costa. Underside. *Forewing* with the basal area clouded with paler vinous-brown, the upper and outer area being purpurescent-grey irrorated with minute blackish strigæ. *Hindwing* violaceous brownish-grey, irrorated with blackish strigæ; the discal band of the upperside more or less visible, as a fascia, by transparency, but of a paler purplish-grey and irrorated throughout; a short similar fascia also extends inwardly from middle of the costa to near middle of the cell.

Female. Upperside paler throughout, the ferruginous markings broader. On the hindwing a pale ferruginous spot is also sometimes present on middle of the costa. Underside similar to the male. *Body*, palpi, and antennæ vinous-brown above, greyish below.

Expanse ♂ ♀  $1\frac{8}{10}$  to  $2\frac{2}{10}$  inches.

HABITAT.—W. and E. Himalayas; S. India; Ceylon; Burma; Tenasserim; Siam; Malay Peninsula; W. China; Hainan.

DISTRIBUTION AND HABITS.—“In the outer Himalayas this butterfly is rare in the West, but much commoner in the East, generally frequenting streams, and often settling, as does also *L. Lepita*, at the end of a dead stick, with folded wings, in which position it exactly resembles a dead leaf. It is a common species in Upper Tenasserim” (de Nicéville l.c. 302). Major H. B. Hellard obtained it in “Kashmir and at Masuri, in September” (MS. Notes). In Sikkim it is “not uncommon at low elevations, from April to October” (H. J. Elwes, Tr. Ent. Soc. 1888, 369). “Found commonly in Sikkim, at low elevations, throughout the warm months. The first brood appears in June” (L. de Nicéville, Sikkim Gaz. 1894, 148). Col. C. Swinhoe records it from the Khasia Hills (Tr. Ent. Soc. 1893, 291); also from Bombay (P. Z. S. 1885, 130). Mr. L. de Nicéville says that “it occurs almost throughout India, the larva feeding on *Celtis*. There are one or two specimens from Ceylon in Mr. Mackwood’s collection, and one in that of Dr. Manders, which came probably from the neighbourhood of Kandy, where doubtless it is not rare, though generally overlooked” (Journ. As. Soc. Bengal, 1889, 195). We possess a female, with broad bands on both wings, from the Nilgiris, which, undoubtedly, is the present species. Specimens in the British Museum are from Mir Jani, Katabagh, N.W. Himalaya, 9000 feet, taken in February by Col. J. W. Yerbury; the Khasia Hills; Tilin Yaw, Upper Burma, taken in December by Capt. E. Y. Watson, from the Thoungyeen and Attaran Valleys, taken in February and November, by Capt. C. T. Bingham. Col. C. H. E. Adamson found it “common about streams in



Tenasserim; Moulmein, June, Meetayi, Upper Tenasserim, January; also taken in Upper Burma not uncommonly, in the cold season, about Saging" (List, 1897, p. 28). Mr. O. Limborg obtained it on the road from Moulmein to Meetan, and at Hatseiga" (P. Z. S. 1878, 832). Dr. N. Manders took it in "most of the valleys of the Shan States, Burma, being quite common in the Meigupon, Legya and Mone Valleys" (Tr. Ent. Soc. 1890, 526). Mr. W. L. Distant records it from Perak, Malay Peninsula (l.c. 448). Mons. G. A. Poujade records it from Siam (Nouv. Arch. du Mus. Paris, 3rd ser. p. 265). Mr. J. H. Leech has examples from Moupin, W. China; and Mr. P. Crowley has it from Hainan, taken by Mr. Whitehead.

Of our illustrations on Plate 392, fig. 1, 1a, is from a Kashmir male, 1b, a Kulu female, 1c, d, e, a Sikkim male and female, and 1f, g, a Moulmein male and female.

**LIBYTHEA RAMA** (Plate 393, figs. 1, 1a, b ♂ ♀).

*Libythea Rama*, Moore, Proc. Zool. Soc. Lond. 1872, p. 556; Lep. of Ceylon, i. p. 68, pl. 33, fig. 2, 2a (1881). de Nicéville, Batt. of India, etc. ii. p. 302 (1886).

IMAGO.—Male. Upperside dark vinous-brown. *Forewing* with an ochreous narrow streak extending along the lower part of the cell and joined to a broader discal streak beyond; an upper and lower, widely-separated, subapical, geminated, paler ochreous or whitish spot. *Hindwing* with a medial-discal narrow ochreous band. Underside pale vinous-brown. *Forewing* with the apex pale purplish-grey mottled with minute blackish strigæ; discoidal ochreous streak broader than on upperside; subapical spots white. *Hindwing* mottled with minute blackish strigæ; medial-discal fascia pale purplish-grey; a short oblique costal similar fascia, and a less defined slender fascia along upper part of the cell.

Female. Upperside as in the male. Underside. *Forewing* as in the male. *Hindwing* more uniformly pale vinous-brown and mottled, the fasciæ less apparent.

Expanse 2 inches.

HABITAT.—Ceylon; S. India.

LIFE HISTORY.—The following detailed description of the life history of this species is by Mr. T. R. D. Bell, as observed by him in the Kanara District of Bombay:—  
 "LARVA.—Feeds on *Celtis tetrandra* (Urticaciæ). At first sight the larva reminds one rather of the larva of a species of *Catopsilia* (Pierinæ). It is the same thickness from segment 4 to segment 10, narrowing to the head and to segment 14; segment 2 is about the same breadth as the head at the front margin, but is wider behind, and has the front margin very slightly produced in the dorsal line; the anal flap is rounded behind, and its dorsal slope is nearly a quarter of a circle, the extremity

nearly touching the resting surface; it has a depressed dorsal mark two-thirds the width of the segment, reaching from its hinder extremity towards the front margin, which surface or mark is covered with brown streaks and has no hairs on it, as has the rest of the segment; the prolegs are rather long; the head is small, being only about half as broad as the larva is at the centre; it has a dull smooth surface set with minute rather sparse dark bristles; a rather large clypeus; it is round in shape, with a shallow broad curved depression on the vertex; is green in colour with brown markings as seen under a lens; antennæ reddish, labrum green, eyes black, and some light hairs about the jaws. The surface of the body is dull, each segment has four broad ridges, that is, each segment is divided into four by thin depressed transverse lines, and on these ridges are rows of minute bristle-like black hairs all over, some even on the ventrum; the spiracles are light yellow, black rimmed, oval, and flush to the surface, of ordinary size. Colour dark green, sometimes with a brownish tinge, with a thin, dorsal, light yellow line from segments 4 to 12, and a narrow, yellow supra-spiracular band from the head to the anal end. Length 26 mm., breadth at middle 4.5 mm., breadth at head 2.25 mm."

PUPA.—"Somewhat resembles that of *Ergolis*, but is fixed with its longitudinal axis parallel to the surface to which it is attached, like that of *Elymnias caudata*; the ventral line is therefore straight from the head to segment 10, and thence the rest of the pupa is at right angles to its longitudinal axis; the front of the pupa, seen from above, is absolutely square, the head ending in a broad straight edge; the head and segment 2 form a trapezoidal piece, which is broadest transversely to the pupa-length; the sides or lateral outline of this trapeze being absolutely straight lines; the dorsal line of the pupa in segments 1 and 2 is slightly convex; the thorax forms at the shoulders the broadest part of the pupa, sloping out suddenly laterally at an angle of 135° with the lateral line of the headpiece; the thorax is somewhat convex and highly carinated along the dorsal line, this carination starting from the front margin in (seen laterally) an absolute straight line to just before the hinder margin, where it ends abruptly in a somewhat rounded peak; the dorsal outline falling thus abruptly from the peak to the hinder margin of the thorax; the dorsal outline of the abdomen starts from segment 3/4 and ascends to a small sharp peak at the margin of segment 5/6, whence it descends gradually in a very slight carination to segment 8/9; and then in a curve of a quarter circle to the cremaster; a thin linear low carination connects the point of the shoulder with the abdominal peak, and the wings are slightly thickened at and behind the shoulders; the transverse section of the abdomen after the peak is nearly circular; the abdominal peak is somewhat higher than the apex of the thoracic carination, and the straight top of the thoracic carination is at an angle of 45° to the longitudinal axis of the pupa. The spiracles of segment 2 are depressed narrow slits, the other spiracles are light, nearly white, ovals facing

somewhat forwards. The cremaster is dorsally triangular, and embraces somewhat the last segment, its attachment-surface being considerably longer, in the sense of the length of the pupa, than its breadth. Colour of pupa light-green, with the tops of all the carinations yellow, with a black speck on the abdominal peak; the surface of the pupa is smooth and somewhat shiny. Length 12·5 mm., breadth at the shoulders 5 mm., breadth at the front of the head just over 3 mm., height at the abdominal peak 6 mm., height at the apex of the thorax 5 mm."

HABITS.—"The eggs are laid on the young shoots and leaves of the *Celtis*, generally on a low shrub near a nullah with water in it and open to the sunlight. The larvæ live generally on the underside of the leaves, eating all but the ribs or veins, to which one finds them hanging; they emit much web, and fall by a silk thread when disturbed, but only when touched or otherwise violently molested; the larva rests with its true legs off the surface, and its head curved down and often turned to one side. The pupa is formed always on the underside of a leaf, and rests quite parallel to the surface of the leaf. The larva reminds one forcibly of a Pierine larvæ of the *Catopsilia*, *Leias*, or *Teracolus* type. The butterfly, which is rare in the Kanara district, appears to be found only in the neighbourhood of its food-plant" (de Nicéville, Journ. As. Soc. Bengal, 1900, 232).

DISTRIBUTION.—In Ceylon it occurs in the Central provinces; hills 4000 to 6000 feet elevation, in forest lands during the S.W. monsoon, from May to October. It darts about and settles on the ground; is shy and not very easy to capture (Capt. Hutchison). Plentiful about 3500 feet and upwards, on the roads and banks of same in the vicinity of jungle (F. W. Mackwood). Occurs also at Kandy and Dickoya" (Lep. Ceylon, i. 68). "Dr. N. Manders notes, that he is inclined to think, from the small material at his disposal, that typical *L. Rama* is found, in Ceylon, from about 5000 feet upwards, and gradually merges into *L. Myrrha* [*Sanguinalis*] in the low country" (de Nicéville, Journ. As. Soc. Beng. 1899, 195). Messrs. J. Davidson and E. H. Aitken say, "This is perhaps the rarest of all our butterflies in the N. Kanara District of Bombay. In six years we have got two specimens, both taken on the top of a high hill near Karwar" (Journ. Bombay N. H. Soc. 1896, 258). Mr. G. F. Hampson records it from the "Nilgiris, 3000 to 7000 feet elevation. The width of the markings varying much, some specimens being typical *L. Myrrha*, some intermediate, and some *L. Rama*" (Journ. As. Soc. Beng. 1888, 355). In Travancore it is "common in the high range of hills" (H. S. Ferguson, Journ. Bombay N. H. S. 1891, 10). Mr. L. de Nicéville says, "Typical specimens from Ceylon, Travancore, the Anamalai and Pulni Hills, and some specimens from Ootacamund are quite distinct from *L. Myrrha* [*Sanguinalis*], but other specimens from Ootacamund, Cannanore and the Wynaad are quite intermediate. *L. Rama* appears to be constant in Ceylon and in the extreme south of the Peninsula, but in

South India its markings gradually approximate to those of *L. Myrrha* as its range extends northwards, till, in the Nilgiris, typical *L. Myrrha* [*Sanguinalis*] is met with'' (Butt. India, ii. 302).

Our illustration of this species on Plate 393, figs. 1, 1a, b, are from typical Ceylon male and female.

**LIBYTHEA LEPITA** (Plate 393, fig. 2, 2a, b, c, d, e, ♂ ♀).

*Libythea Lepita*, Moore, Catal. Lep. Mus. E. I. Company, i. p. 240 (1857). Doherty, Journ. As. Soc. Bengal, 1886, p. 135. de Nicéville, Butt. of India, etc. ii. p. 303 (1886). Pryer, Rhop. Nippon, p. 21, pl. 5, fig. 13 (1887). Leech, Butt. of China, etc. i. p. 288 (1893).

IMAGO.—Male and female. Upperside deep vinous-brown. *Forewing* with a ferruginous streak, extending along the lower half of the cell and bent more or less squarely upward at its end, where it is joined at its lower outer-angle to a large, more or less rounded, discal spot, this spot being sometimes disconnected from the cell-streak; beyond are two subapical pairs of geminated spots, the upper pair and the upper of the lower pair being sullied white or pure white, and the lower of the latter pair ferruginous. *Hindwing* with a medial-discal ferruginous angulated band, which is broadest outward, and in some specimens, it is there joined to, or separated from a very small pale ferruginous spot situated between the subcostals; a pale patch also present on middle of the costa. Underside paler than in *L. Sanguinalis* or *Myrrha*. *Forewing* with the cell-streak and discal spot, as on upperside, paler ferruginous; the costa, apex, and outer border being pale purpurescent-grey mottled with blackish strigæ. *Hindwing* pale purpurescent-grey, with more or less apparent darker ordinary fasciæ, and mottled with blackish strigæ.

Expanse ♂ ♀  $1\frac{8}{10}$  to  $2\frac{2}{10}$  inches.

HABITAT.—W. and E. Himalayas; Assam; Upper Burma; W. China; Japan.

DISTRIBUTION.—“Occurs throughout the outer ranges of the Himalayas at moderate elevations. There is a single specimen from Assam, in the Indian Museum, Calcutta” (de Nicéville, l.c. 303). Capt. A. M. Lang obtained it at Kasauli, W. Himalaya, in May and June, and more abundantly in July” (MS. Notes). Major H. B. Hellard took it in Pangri, Busahir, at Masuri, and Kashmir, July, August, and September” (MS. Notes). Specimens from Narkunda, taken in April by Capt. H. McArthur, are in Mr. J. H. Leech’s collection. Col. J. W. Yerbury took it at Rawul Pindi in April, being also “common at Murree in August and September. Two taken near Campbellpur and one near Lawrencepur in November” (P. Z. S. 1886, 363). In the British Museum are examples taken at Thundiani in September by Col. Yerbury; from Dalhousie, taken in May and October by Major Harford; from Ladak, taken by Mr. F. E. Adair, and a male from

the N. Chin Hills, Upper Burma, taken at 5500 feet elevation, in May, by Capt. E. Y. Watson. Mr. L. de Nicéville records it from Upper Burma (Journ. As. S. Beng. 1889, 193). Mr. H. J. Elwes says, "it is found in Sikkim, rather commoner than *L. Myrrha*, at low elevations, from April to October" (Tr. Ent. Soc. 1888, 369). Mr. de Nicéville records it as "much rarer in Sikkim than *L. Myrrha* and occurs at similar places and seasons" (Sikkim Gaz. 1894, 148). Mr. J. H. Leech took examples in "W. and C. China, and Japan" (l.c. i. 288).

HABITS.—Mr. H. Pryer (Rhop. Nippon, p. 21) says, in Japan "there is only one brood of this butterfly. It is the longest lived in the perfect state, of any of the Lepidoptera. It emerges from the pupa in July and lives until the following May. It retires to its hybernaculum soon after its emergence, and remains quiescent until the following March, when it is awakened by the first warm day, and may then be seen depositing its eggs on the unopened buds of the *Celtis*. The pupa is suspended by the tail, after the manner of a *Vanessa*."

Of our illustrations on Plate 393, fig. 2 is of a male from Pangri, Busahir, 2a, a female from Kashmir, and 2b, c, d, e, a male and female from Simla.

#### LIBYTHEA LEPITOIDES (Plate 394, fig. 1, 1a, c, ♂).

*Libythea Lepita*, Hampson, Journ. As. Soc. Bengal, 1888, p. 355.

IMAGO.—Male. Upperside with the ferruginous markings less sharply defined than in *L. Lepita*. *Forewing* differs in the cell-streak being broken into two portions, and the contiguous discal spots somewhat smaller; both subapical spots entirely white and smaller. *Hindwing* with the medial-discal band similar. Underside. *Forewing* with the cell-streak broader than on the upperside and partly broken, the basal portion being also much diffused; the discal spot paler, subapical spots white; mottled apex pale grey. *Hindwing* paler grey, with more thickly mottled darker fasciæ, in some these fasciæ are very prominently black; a distinct small patch of black scales is present on the disc in the discoidal interspace beyond base of the upper median veinlet.

Expanse  $1\frac{8}{10}$  to 2 inches.

HABITAT.—Nilgiris, S. India; Ceylon.

DISTRIBUTION.—"Nilgiris; Western Slopes, 3000 to 4000 feet elevation; rare; February" (Hampson, l.c.). Males, taken in the Nilgiris in February and October by Mr. G. F. Hampson, and one from Kolar, Nilgiris, taken in November, are in the British Museum. Two males, from Koonoor, Nilgiris, are in Mr. F. du Cane Godman's collection. A male, from Kandy, Ceylon, taken in May, 1892, by Col. J. W. Yerbury, is also in the British Museum. Mr. L. de Nicéville records this species (as *Lepita*) from Ceylon, three specimens being in Mr. F. Mackwood's collec-

tion, and several in that of Dr. N. Manders, all taken in the low country" (J. A. S. Bengal, 1899, 195).

Our illustrations on Plate 394, figs. 1, 1a, are from a Nilgiri male, in Mr. F. Godman's collection.

**LIBYTHERA LIBERA** (Plate 394, fig. 2, 2a, ♂).

*Libythera Libera*, de Nicéville, Journ. Bombay, Nat. Hist. Soc. 1890, p. 207, pl. D. fig. 6, ♂.

IMAGO.—"Male. Upperside. Both wings rich glossy brown, rather paler towards the base. Cilia brown. *Forewing* with an oblique oval whitish spot outwardly faintly defined with ochreous at the end of the discoidal cell; a similar round spot in the middle of the first median interspace; a tripartite subcostal white spot placed about midway between the end of the cell and the apex of the wing, its uppermost portion a mere dot, its middle portion twice the size, its lower-most portion quadrate and very much larger; two rounded spots placed outwardly and below the subcostal spot, divided by the lower discoidal nervure. *Hindwing* with a large quadrate whitish spot on the middle of the costa; an oblique discal macular ochreous band formed of four portions, the one towards the apex of the wing the largest. Underside. *Forewing* fuscous-brown, the apex paler and mottled with whitish; the spots as above, but the subcostal completely amalgamated; the basal half of the cell occupied by a dull ochreous band. *Hindwing* glossy purplish-brown, heavily striated with white; an oblique quadrate white spot on the middle of the costa bounded posteriorly by the first subcostal nervule; a white increasing streak from near the base of the wing extending to the middle of the wing placed on the subcostal nervure; an oblique narrow whitish band extending from near the abdominal margin to near the apex of the wing, coincident with the ochreous macular band of the upperside."

Expanse, ♂  $2\frac{2}{10}$  inches.

HABITAT.—Lower Burma; Tenasserim; Malay Peninsula.

"Very near to *L. Narina*, Godt, from Ceram, and to *L. Rohini*, differing from the latter species, however, in its larger size, the spot in the cell and the one below it in the first median interspace of the forewing not being 'pure white' but outwardly defined with ochreous; the discal band on the hindwing ochreous instead of pure white, and more macular; and the cilia throughout concolorous with the wings instead of whitish. The underside is darker, the white striations much less numerous" (de Nicéville, l.c.)

DISTRIBUTION.—"A single specimen was taken at Syinbyudine on the Tavoy-Siam frontier in December." A male from Tiliu Yaw, taken in March, by Capt. E. Y. Watson, and another from Thoungyeen, taken in February, is in the British

Museum collection. A male, from Momeit, Lower Burma, taken at 2000 feet elevation, in June 1890, by Mr. W. Doherty, is in the collection of Mr. F. du Cane Godman. A male, from Perak, Malay Peninsula, identically the same as the Momeit example, is in Mr. P. Crowley's collection.

Our illustrations of this species on Plate 394, fig. 2, 2a, are from the Burmese male in Mr. F. Godman's collection.

**LIBYTHEA ROHINI** (Plate 394, fig. 3, 3a, ♀).

*Libythea Rohini*, Marshall, Journ. Asiatic Soc. Bengal, 1880, p. 248, ♀. de Nicéville, Butt. of India, etc., ii. p. 303, pl. 24, fig. 114, ♀ (1886).

IMAGO.—Male and female. “Upperside; both wings brown, with pure white markings; cilia white. *Forewing* with an oval spot filling the end of the cell, a large quadrate spot on the disc between the first and second median nervules, two spots coalescing one on each side of the lower discoidal nervule, and a spot near the costa divided into three portions by the subcostal nervules. *Hindwing* with a large square spot on the middle of the costa, a straight median band across the wing below the cell not reaching the inner or outer margins, and cut by the discoidal and three median nervules, and a small spot above between the subcostal nervules. All the spots and bands pure white. Underside; both wings paler. *Forewing* with the white markings as above, a pale ochreous streak filling the base of the cell, the apex and inner angle whitish, streaked with brown. *Hindwing* with the quadrate costal spot and discal band of the upperside, but less well-defined, the wing more or less whitish, striated with brown. Cilia throughout more or less white.”

Expanse, 2 inches.

HABITAT.—Khasia Hills; Assam; Malay Peninsula; Sumatra.

DISTRIBUTION.—“The type specimen, in Major Marshall's collection, was taken near Shillong, in May, by the late Mr. J. P. Cock. Other specimens have been obtained in May and October, by Mr. Cock, and by Dr. E. R. Johnson, near Shillong” (de Nicéville, l.c.). Mr. W. Doherty obtained two specimens in the Dhansiri Valley, Upper Assam, in June, 1889, and are erroneously referred to *L. Narina* by Mr. H. J. Elwes, in P. Z. S. 1891, 285. A male, from Perak, Malay Peninsula, is in the collection of Mr. P. Crowley. Mr. L. de Nicéville (Journ. As. Soc. Bengal, 1895, p. 437) records it under the name of *Narina*, from N. Sumatra.

**LIBYTHEA ALOMPRA** (Plate 394, fig. 4, 4a, ♂).

*Libythea Geoffroyi*, de Nicéville, Journ. Bombay Nat. Hist. Soc. 1890, p. 205, pl. D. fig. 5, ♂ (*nee Godart*).

IMAGO.—“Male. Upperside. *Forewing* brownish-fuscous; the posterior two-thirds of the discoidal cell and the basal two-thirds of the wing from the third median nervule to the inner-margin shining violet, bearing at the end of the cell and on the median interspaces slightly paler spots, caused by the white spots of the underside showing through by transparency; a small cordate white spot in the interspace between the subcostal nervule and upper discoidal nervule, beyond and below which are two similar spots placed one below the other, divided by the lower discoidal nervule. *Hindwing* pale brown, the immediate base glossed with pale violet; a discal fascia composed of three dull orange spots from the second median to the lower subcostal nervule. Underside. *Forewing* pale brown, dark brown on the disc, the costa and apex of the wing widely grey, irrorated with fine black dots; the cell almost entirely occupied by a broad ochreous streak; the three subapical spots as on the upperside, but the two lower of these spots connected by a minute spot placed between them; two discal white spots outwardly-defined by pale ochreous placed in the middle of the median interspaces, the upper one small and elongated; the lower large and quadrate, fully four times as large as the upper. *Hindwing* greyish-brown, profusely mottled throughout with blackish; an obscure oblique paler band extending from about the middle of the costa to the middle of the cell, its outer-edge marked with a prominent black dot at the base of the second subcostal nervule; a somewhat quadrate similar spot in the middle of the subcostal interspace; and a discal band coincident with the dull orange macular band of the upperside, but more extended, nearly reaching the outer margin.

Female. Upperside. *Forewing* with the violet area duller and confined to the immediate base of the wing; a quadrate white spot at the end of the discoidal cell; a tripartite subcostal spot; another elongated spot from the third median to the upper discoidal nervule, placed outwardly below it; a large quadrate discal spot completely filling the interspaces between the first and third median nervules. *Hindwing* with no violet gloss at the base, otherwise as in the male. Underside. *Forewing* with the cell orange, but outwardly terminated by a large white spot, the other spots as on the upperside. *Hindwing* as in the male, but all the markings more obscure.”

Expanse, ♂ ♀  $2\frac{1}{10}$  inches.

HABITAT.—Tenasserim; Lower Burma; Siam.

DISTRIBUTION.—Mr. L. de Nicéville records “three males and one female from Synbyudine, on the Tavoy-Siam frontier, taken in December and January. It probably more or less mimics one of the blue *Euplœas* when flying; when at rest its mottled underside, so like that of a dead leaf, proves of sufficient protection” (D. N. l.c.). A male, from Ataran Valley, middle Tenasserim, taken in March, 1894, by Mr. T. A. Hauxwell, is in the collection of Mr. H. Grose-Smith. A male, taken in



the Ataran Valley, in February, by Col. C. H. Bingham, is in the British Museum. It is probably this species, recorded by Mons. G. A. Poujade (Nouv. Arch. du Mus. Paris, 3rd ser. III. p. 265) as *L. Geoffroyi*, as having been taken by Mons. Pavié at Luang Prabang, Siam.

Distinguishable from typical *L. Geoffroyi*, on the upperside of the male, by its lighter brown ground-colour, the forewing having the violet area more purplerescent in tint, being also more restricted within the lower half of the cell, and on the disc extending hindward only from the upper median veinlet.

Our illustrations of this species, on Plate 394, fig. 4, 4a, are from a male taken in the Ataran Valley by Mr. Hauxwell.

**LIBYTHEA HAUXWELLI** (Plate 394, fig. 5, 5a, ♂).

*Libythea Geoffroyi* (part), de Nicéville, Journ. Bombay Nat. Hist. Soc. 1899, p. 333.

IMAGO.—Male. Upperside. Both wings much paler than in *L. Alompra*. Forewing with the costal border, only, pale brown, the entire cell and outer area of the wing being pale violet, the three subapical spots and the two discal spots of the underside showing very indistinctly through by transparency. Hindwing with the discal transverse macular fascia very indistinctly defined and of a paler violet tint than the basal area. Underside. Forewing paler than in *L. alompra*, the ground-colour being pale ochreous-brown, the cell and lower basal area pale ochreous, the subapical and discal spots ill-defined. Hindwing pale ochreous-brown, mottled with darker brown; the subbasal and discal fascia broader, whitish, and diffused.

Expanse, ♂  $1\frac{8}{10}$  to  $2\frac{2}{10}$  inches.

HABITAT.—Tenasserim.

DISTRIBUTION AND HABITS.—Males from Mr. J. A. Hauxwell's collection, taken in Tenasserim, are in Mr. H. Grose-Smith's collection, and from which our illustration on Plate 394 is taken. A male, also from Tenasserim, taken by Capt. E. Y. Watson, is in the British Museum. Mr. Hauxwell notes "males only seen. Found always on the sand at the edge of the water, sucking up the moisture" (de Nicéville, l.c.).

INDO- AND AUSTRAL-MALAYAN SPECIES OF LIBYTHEA.—*Libythea Myrrha*, Godart, Encyc. Méth. ix. p. 171 (1819). Boisduval, Spéc. Gén. Lép. i. pl. 10, fig. 8 (1836). Hübner, Zutr. Exot. Schmett. iv. fig. 789, 790 (1832). Habitat. Java; Sumatra?; Borneo; Bali; Lombok; Sumbawa.—*Libythea hybrida*, Martin, Iris, ix. p. 353 (1896). Habitat. Sumatra.—*Libythea Narina*, Godart, Encyc. Méth. ix. p. 171 (1819). Habitat. Céram.—*Libythea Neratia*, Felder, Reis. Novara, Lép. ii. p. 313 (1865). Habitat. Halmaheira.—*Libythea Luzonica* (*L. narina*, Semper, Reis. Phil. Lép. p. 154, pl. 30, fig. 21, ♂ (1889). Habitat. Luzon.—*Libythea Philippina*, Staudinger, Lép. Palawan, p. 87. Syn. L. Antipoda, Feld. R. Nov. Lép. ii. p. 313, pl. 42, fig. 9, 10,

♂ (1865). Semper, R. Phil. Lep. p. 155, pl. 30, fig. 22, ♀. *Habitat.* Philippines.—*Libythea Geoffroyi*, Godart, Enc. Méth. ix. p. 813 (1823); *id.* Mém. Soc. Linn. Paris, ii. Lep. pl. 2 (1823). Wallace, Tr. Ent. Soc. 1869, p. 335, ♀. *Habitat.* Timor; Flores (Wallace); New Guinea (Fruhstorfer).—*Libythea Antipoda*, Boisd. Bull. Soc. Ent. France, 1859, p. 157. *Habitat.* New Caledonia.—*Libythea Ceramensis*, Wallace, Trans. Ent. Soc. 1869, p. 366, ♂. *Habitat.* Ceram.—*Libythea Batchiana*, Wallace, *l.c.* p. 336, ♂ (1869). Staud. Exot. Schmett. pl. 87, fig. ♂ (1888). *Habitat.* Batchian.—*Libythea Celebensis*, Staudinger. *Habitat.* Minahassa.

### Family RIODINIDÆ.

*Erycinidæ*,\* Swainson, Phil. Mag. ser. 2, i. p. 187 (1827). Westwood, Intr. Ent. ii. p. 357 (1840), *id.* Gen. D. Lep. ii. p. 415 (1851). Stephens, Catal. Brit. Lep. B.M., i. p. 16 (1850). Bates, Journ. Entom. ii. p. 176 (1864). Distant, Rhop. Malayana, p. 185 (1883). Doherty, Journ. As. Soc. Bengal, 1886, pp. 110, 134. Staudinger and Schütz, Exot. Schmett. ii. p. 227 (1892).

*Erycinides*, Boisduval, Ind. Méth. Eur. Lep. p. 14 (1840).

*Erycinites*, Blanchard, Hist. Nat. Ins. ii. p. 343 (1845).

*Erycinina*, Plotz, Mitth. Nat. Ver. Neu-Vorp Rigen, xvii. p. 7 (1886).

*Lemoniales*† (part), Hübner, Verz. bek. Schmett. p. 26 (1816).

*Lemoniidæ*, Kirby, Syn. Catal. D. Lep. p. 282 (1871); *id.* Allen's Nat. Hist. Lep. ii. p. 6 (1896).

*Lemoniidæ* (part), de Nicéville, Butt. of India, ii. p. 299 (1886). Moore, Lep. of Ceylon, i. p. 67 (1881); *id.* Lep. Indica, i. p. 2 (1890).

*Lemoniine*, Scudder, Butt. U.S. p. 772 (1888-9).

*Riolinidæ*, Grote, Trans. Ent. Soc. Lond. 1897, pp. 310-1.

### CHARACTERS OF THE RIODINIDÆ.

IMAGO.—Of small or medium size. Wings variable in form. Cell closed. Hindwing with a precostal vein. Forelegs of male more or less atrophied, brush-like, clothed with long fine hairs, the tarsi consisting of a single unarmed joint. Forelegs of female longer, slender, scaly; tarsi perfect, with the joints longer and more distinct than in the Nymphalidæ. Palpi very small, short, horizontal.

LARVA.—Subcylindrical or sub-onisciform, short; frequently covered with dense pile and sometimes ranged hairs or fascicles of hairs, or with lateral fleshy appendages.

PUPA.—Short, either slightly or not angulated. Recumbently-suspended by the tail, or, in addition, attached by a median girth.

EGG.—“Not so high as wide, smooth, granulate or prickly, neither reticulate nor radiate” (Doherty, *l.c.* 110).

*Erycina* preoccupied in Mollusca.

† The type of genus *Lemonias*, Hübner, is a Melitæid. See Lep. Ind. v. p. 2.

## Sub-family NEMEOBIINÆ.

- Erycininae*, Bates, Journ. Ent. ii. p. 176 (1864). Moore, Lep. of Ceylon, i. p. 68 (1881).  
*Nemeobiinae*, Bates, Journ. Linn. Soc. Zool. ix. pp. 370, 412 (1867-8). Kirby, Syn. Catal. D. Lep. p. 284 (1871); *id.* Allen's Nat. Hist. Lep. ii. p. 9 (1896). Distant, Rhop. Malay. p. 186 (1883). de Nicéville, Butt. of India, etc., ii. p. 305 (1886). Doherty, Journ. As. Soc. Beng. 1886, p. 134. Staudinger and Schätz, Exot. Schmett. ii. p. 230 (1892). Tutt, Brit. Butt. pp. 16, 210 (1896).  
*Nemeobiidae*, Grote, Trans. Ent. Soc. Lond. 1897, pp. 340-1.

## CHARACTERS OF THE NEMEOBIINÆ.

IMAGO.—Wings variable in form. *Forewing*, in Nemeobius, and in the Asiatic genera, with five subcostal branches; the upper discocellular very minute or obsolete; the cell closed. *Hindwing* with the abdominal margin slightly channelled; the precostal vein either short or prominently developed; cell closed. *Body* moderately sized. Eyes either naked or hairy. Antennæ slender, with a short spatulate, or more elongated club. Palpi horizontal, generally small and slender. Forelegs of male small, brush-like, clothed with long fine hairs. Forelegs of female longer, slender, scaled; tarsi perfect.

LARVA.—Short; sub-onisciform; pubescent, or with numerous dorsal and lateral short fine hairs.

PUPA.—Short; fusiform; truncatedly rounded in front, flattened; smooth, or laterally pubescent; recumbently attached to a leaf by the tail and a median girth.

## Genus DODONA.

- Dodona*, Hewitson, Exotic Butt. ii. p. 91 (1861). de Nicéville, Butt. of India, etc., ii. p. 309 (1886). Staudinger and Schätz, Exot. Schmett. ii. p. 231 (1892). Leech, Butt. of China, etc., i. p. 290 (1893).

IMAGO.—*Forewing* triangular; costa very slightly arched from the base, apex obtuse, exterior margin slightly oblique and almost even; cell somewhat narrow, extending to half the wing; costal vein short, bent upward and ending on the costa at half length of the margin; first and second subcostal branches emitted before end of the cell, both short, third branch at one-third, fourth at nearly two-thirds and ending at the apex, fifth ending below the apex; upper discocellular veinlet obsolete, middle and lower discocellular deeply concave, of nearly equal length; upper radial emitted in a line with the subcostal, lower radial from middle of the discocellulars; middle median veinlet emitted immediately before lower end of the cell. *Hindwing* short, somewhat triangular, produced posteriorly; costal margin abruptly lobate at the base, apex rounded, exterior margin obliquely convex, slightly scalloped, angled outward at end of upper median, and the anal angle

produced into a broad outwardly-pointed lobe, and in some species ending in a slender tail; abdominal margin long; precostal vein short, curved, emitted opposite junction of the subcostal vein; cell rather broad; discocellulars very oblique and long; subcostal branch emitted at some distance beyond end of the cell; \* middle median branch at a short distance before lower end of the cell. Thorax rather stout; abdomen moderate; head broad; eyes minutely hairy; palpi elongated, slender, second joint extending nearly half its length beyond the head, smoothly scaled above, first and second joint compactly hairy beneath, apical joint rather long, pointed, smooth; antennal club short and broadly spatulate; *forelegs of male* small, clothed with fine soft hairs, *forelegs of female* long, slender, scaled; femur fusiform, clothed laterally with broad serrate-tipped scales and beneath with a few fine silky hairs; tibia and tarsus clothed with narrow spiny scales; tarsus five-jointed, each with two lateral stouter spines, fifth joint with a pair of slender lengthened claws, broad paronychial and small pulvillus.

TYPE.—D. Durga.

**DODONA DURGA** (Plate 395, fig. 1, 1a, ♂, 1b, c, ♀).

*Melitæa Durga*, Kollar, Hügel's Kaschmir, iv. pt. 2, p. 441, pl. 13, figs. 3, 4 (1844).

*Dodona Durga*, Hewitson, Exot. Butt. ii. p. 91 (1861). Moore, Proc. Zool. Soc. Lond. 1865, p. 503. de Nicéville, Butt. of India, etc., ii. p. 310 (1886).

*Taxila Durga*, Butler, Proc. Zool. Soc. 1886, p. 364.

IMAGO.—Male and female. Upperside vinaceous-brown with numerous yellowish-ochreous spots. Cilia alternated with white. *Forewing* with an ochreous bar across middle of the cell and continued obliquely below to the submedian, another bar at end of the cell, a larger parallel one beyond the cell from the costa to the upper median veinlet, two subapical spots, two lower discal spots placed near the bases of the median interspaces, another spot in the submedian interspace beyond the lower of the latter spots, followed by a submarginal row of smaller spots placed in four pairs out-of-line, the lowest pair being narrowest, and then a marginal lower row of five smaller linear spots. *Hindwing* with an ochreous slender line at end of the cell, an irregular discal series of spots, the two lower being narrowest, followed by a submarginal and a linear series, which coalesce above the anal angle. Underside. Both wings dark brownish-ochreous. *Forewing* with the base and posterior margin dusky brown, the base of the costa and also the base of the cell, enclosing a black spot; the other markings as on upperside, pale ochreous-yellow, the outer lower spots being brighter ochreous. *Hindwing* with all the veins

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\* In all the species here given under this genus, except *Dipæa*, in which the subcostal branch is emitted before end of the cell.

on the basal half pale ochreous-yellow; a short pale ochreous-yellow basal and a subbasal costal streak; a transverse band from the costa crossing middle of the cell and then tapering to the submedian fold, where it meets a fine line defining the fold, the latter being joined at the base to the submedian vein; a slender bar at end of the cell; two short outer broader bars on the costa, and two lower-discal broken series of decreasing bands, the inner series being inwardly defined by a black line ending above anal angle, and then continuing in two lines up the abdominal margin; beyond is a submarginal band from the second subcostal branch, where it is marked by two superposed black spots, followed by a narrower lower marginal band, both bands uniting posteriorly and ending in a bright ochreous anal patch marked by black streaks; anal lobe also with a black spot.

Female larger; wings broader, the outer margins more convex. Upperside similar to the male, the markings being generally paler. Underside also as in male, with paler markings.

Expanse, ♂ ♀  $1\frac{4}{10}$  to  $1\frac{6}{10}$  inch.

HABITAT.—Outer ranges of Western Himalayas; ? Burma.

DISTRIBUTION.—“This is a very common species all over the outer ranges of the Western Himalayas as far as Murree and Kashmir” (de N. *loc.*). Capt. A. M. Lang found it “common on pasture and grassy slopes in the W. Himalayas, from 5000 to 8000 feet. It is fond of sunshine. Flight quick, almost Hesperidan” (P. Z. S. 1865, 503). Major H. B. Hellard took it in “Kashmir, Masuri, and Simla, from June to October” (MS. Notes). Capt. R. Bayne Reed also found it in Kashmir (MS. Notes). Col. J. W. Yerbury records it as “common at Murree in August and September. Found along the hills to Thundiani; also at Dewal, and at Kali Pani in October” (P. Z. S. 1886, 364). Mr. W. Doherty took it in “Kumaon generally, from 2500 to 8000 feet” (Journ. As. Soc. Beng. 1886, 134). Mr. L. de Nicéville possesses an empty pupa case, obtained at Simla by Col. Marshall, which he describes as being attached to the underside of a small leaf near the tip, the long axis of the pupa being parallel to the midrib, over which it partly lies, with the head directed towards the tip of the leaf. It is fixed in position by the tail, and by a median girth as in *Z. flegyas*, from which it only differs (as far as can be judged from empty shells only) in being less flattened and narrower throughout, the abdominal segments especially being much attenuated and ending almost to a point as in *A. prunosa*. It does not appear to have been covered with hair” (Proc. As. Soc. Beng. 1890, 138). We possess examples from Masuri, Kusauli, Murree, Campbellpur, Dharmasala, and Nepal. Mr. J. H. Leech has specimens from Kujjar, April, and from Chumba, 2700, May, taken by Capt. McArthur; Sultanpur, Kulu, Narkunda, 7000 feet, April. A male, labelled “Burma, October,” from Major Harford’s collection, is in the British Museum.

**DODONA DIPÆA** (Plate 395, figs. 2, 2a, ♂, 2b, c, ♀).

*Dodona Dipæa*, Hewitson, Exotic Butt. iii. *Dod.* pl. fig. 3 (1866). de Nicéville, Butt. of India, etc., ii. p. 311, pl. 24, fig. 116 ♂ (1886).  
*Tavila Dipæa*, Butler, P.Z.S. 1886, p. 364.

IMAGO.—Male. Upperside. Both wings dark fuliginous-brown; cilia slightly edged with white. *Forewing* with a white or sullied ochreous-white slender bar across middle of the cell and continued obliquely below to the submedian vein, a slightly broader broken macular band beyond the cell extending from the costa to upper median, two subapical spots beyond, two spots near bases of the median interspaces, another spot in the submedian interspace beyond the lower of the latter, followed by a submarginal row of smaller spots placed in four pairs out of line, the lower pair being coalescent and less defined, and then a marginal row of more or less posteriorly obsolescent dots. *Hindwing* with an ochreous-white very slightly perceptible inner-discal transverse broken line, an upper-discal slender more defined broken band, and two marginal lunular lines, the latter interspaced anteriorly by two black spots slightly edged with white, the anal lobe being also black and edged with white. Underside paler, ochreous-brown. *Forewing* with markings as above, but more prominent, the apical spots being glossy-white, the lower dull and tinged with pale yellow, the discal interspaces being diffusedly blackish; there is also a basal and subbasal bar and a slightly-defined slender discocellular streak. *Hindwing* crossed by a narrow basal and subbasal glossy-white band, which join above the anal angle and then continue obsolescently up the abdominal margin; beyond is a glossy-white bar on middle of the costa, and an interrupted lower-discal narrow band, followed by two ill-defined submarginal paler, but not glossy, lunular lines; the discal and the two latter being bent sinuously upward and are black edged above the anal angle; the submarginal lines enclose two black spots ringed with white, and the subbasal band is outwardly-edged with black, the costal and discal band being inwardly black-edged; the anal lobe has a large reniform black spot edged with white.

Female. Larger, the apex of forewing less pointed; the outer margins convex. Upperside with markings more prominent. Underside marked exactly as in male.

Expanse, ♂  $1\frac{4}{10}$  to  $1\frac{8}{10}$ , ♀  $1\frac{8}{10}$  to  $1\frac{9}{10}$  inch.

HABITAT.—W. and E. Himalayas; Naga Hills.

DISTRIBUTION.—“It occurs in Masuri, Nepal, and is somewhat common in Sikkim in October and November at about 6000 feet elevation” (de N. *l.c.* 311). We possess examples taken by Capt. A. M. Lang in Masuri, 7000 feet, in June, and from Bhotan, taken by Mr. G. H. Dudgeon in August. Examples from Sultaunpur, Kulu, are in Mr. Leech’s collection. Capt. A. M. Lang took it at “Masuri, in May

and June, basking with expanded wings on a bush" (MS. Notes, p. 203). Col. J. W. Yerbury records it as "uncommon at Murree, a few only taken in August, and two or three below Thundiani, in September" (P. Z. S. 1886, 364). Specimens from Ranikhet, 5000 feet, E. Kumaon, taken in June and July, are in the British Museum. "Common in Sikkim from 6000 to 10,000 feet, from April to December, in forests" (de Nicéville, Sik. Gaz. 1894, 149). Mr. W. Doherty took it in the Naga Hills at about 6000 feet (P. Z. S. 1891, 288).

**DODONA DRACON** (Plate 395, fig. 3, ♂).

*Dodona Dracon*, de Nicéville, Journ. Asiatic Soc. Bengal, 1897, p. 555, pl. 2, fig. 14, ♂.

"Male. Upperside. Both wings glossy hair-brown. *Forewing* bears on the disc numerous pale ferruginous spots, those towards the costa being whitish. *Hindwing* bears on the outer half four somewhat obscure macular pale ferruginous bands; anal lobe is black, bisected longitudinally by an ochreous line, which line is continued along the submedian nervure almost to the base of the wing. Underside. Both wings clear brownish-ochreous, with pure white markings; two subcostal decreasing white bands, commencing broadly on the forewing at the costa, ending on the submedian nervure, commencing again on the hindwing at the costa, near the anal angle approaching each other and becoming very narrow, recurved to the abdominal margin. *Forewing* with two short parallel white lines at the end of the discoidal cell; placed anteriorly midway between these two lines is a trifold white spot which reaches the costa, and posteriorly are two other spots also placed midway between the cell lines, the anterior one in the first median interspace, the posterior one placed a little outwardly as regards the spot anterior to it in the submedian interspace; beyond these two last-named spots are three other spots, the uppermost is white and is in the second median interspace, the other two are black and placed posterior to it; a trifold subapical spot from the costa to the upper discoidal nervule; a submarginal series of small white spots; and a fine white marginal line. *Hindwing* with a short narrow white line on the middle of the disc from the second subcostal to the second median nervule; two fine submarginal white lines; the anal lobe black, bisected as above by an ochreous line, the lobe anteriorly defined by a white line, anterior to this again is a fine black zigzag line extending from the abdominal margin to the second median nervule; the abdominal margin bears three fine parallel white lines, the innermost on the extreme margin. Cilia whitish. Thorax and abdomen above black, beneath whitish; antennæ black."

Expanse, ♂  $1\frac{5}{10}$  inch.

HABITAT.—North Shan States, Upper Burma.

“Described from a single example taken at Kangmong in Hsenwi, North Shan States, in March, 1895, by Major F. B. Longe, R.E. It is near to *D. Dipæa*, differing therefrom in its smaller size, the clearer ochreous shade of the ground-colour on the underside, all the bands and spots being pure white instead of a more or less ochreous or silvery, and the anal lobe being bisected by an ochreous line.” (de N. *l.c.*)

**DODONA EUGENES** (Plate 396, figs. 1, 1a, ♂, 1b, ♀, 1d, larva and pupa).

*Dodona Eugenes*, Bates, Journ. Linn. Soc. Zool. ix. p. 371 (1867). Moore, Proc. Zool. Soc. Lond. 1882, p. 244. Swinhoe, Proc. Zool. Soc. 1885, p. 130. de Nicéville, Butt. of India, etc. ii. p. 315 (1856). Mackinnon, J. Bombay N. H. S. 1897, 378, pl. V. fig. 12, a-d.  
*Tarila Eugenes*, Butler, Proc. Zool. Soc. 1886, 364.

IMAGO.—Male. Upside dark fuliginous-brown. *Forewing* with whitish or sullied brownish-whitish markings, similar to those in *D. Dipæa*, but all somewhat larger. *Hindwing* with a sullied-whitish slightly-defined inner-discal transverse narrow fascia, a broader upper-discal more defined fascia decreasing in width posteriorly, followed by two marginal lunular lines, the latter interspaced anteriorly by two blackish spots, the anal lobe being also black and edged with white. Underside much paler brown or brownish-ochreous. *Forewing* with very prominent glossy-white markings, as on upperside, but all being broader; there is also a basal and subbasal similar bar uniting along base of the costa. *Hindwing* with very prominent transverse glossy-white broad short basal and longer subbasal, a broken narrow discal, and a broad upper outer-discal band, the subbasal and discal being angulated posteriorly and then bent upward along abdominal margin; beyond are two less-prominent submarginal lunular lines apically bearing two black spots, the inner line slightly but diffusely black edged; anal lobe prominently black, edged above with a white and black line and then a grey speckled patch.

Female. Upside paler brown; markings similar to the male, but broader and paler, and on the hindwing the two discal fasciæ both end in a whitish costal spot. Underside paler brownish-ochreous than in the male; markings the same but less glossy.

Expanse ♂  $1\frac{4}{10}$  to  $1\frac{8}{10}$ , ♀  $1\frac{6}{10}$  to 2 inches.

HABITAT.—Outer ranges of W. and E. Himalayas; Assam; Jaintia and Khasia Hills.

DISTRIBUTION.—“It occurs throughout the outer ranges of the Himalayas, from Muree to Bhotan. In Simla, the species occurs in the summer, the females hibernating and appearing again early the next spring.” (de N. *l.c.* 315.) Major H. B. Hellard took it in “Kashmir and Masuri, in September, and early in October” (MS. Notes). Captain A. M. Lang’s Note (P. Z. S. 1865, 503) under *D. Egeon*, refers to



this species, which, he says, was "observed once only, in September, in a richly-wooded Himalayan glen. I passed this glen once in September. In former or subsequent months I never saw this insect there; it appears to have therefore but one short-lived autumnal brood. The insects were pretty numerous, seated on tall Umbelliferae, and flitting from plant to plant with short quick flights, in an open glade in the glen close to the stream." We possess examples from Murree (August), Masuri (June), both taken by Capt. Lang, and others from Nepal, taken by General G. Ramsay. Mr. W. Doherty obtained it at "Naini Tal, 6000 to 7000 feet, and at Loharkhet, 5600 feet, Kumaon" (Journ. As. Soc. Beng. 1886, 134). Col. J. W. Yerbury took it at "Murree in September, and at Thundiani near Kali Pani in September" (P. Z. S. 1886, 364). Col. C. Swinhoe has examples from Kulu, taken by Mr. G. Young, and many of both sexes from the Jaintia and Khasia Hills. In Sikkim, it is found at the same times and places with the much commoner *D. Dipwa*." (de Nicéville Sikk. Gaz. 1894, 149). An example from Bhotan, taken in June by Mr. G. C. Dudgeon, is in the British Museum. "Larva feeds on grasses and hill bamboo" (Mackinnon, *l.c.*).

**DODONA EGEON** (Plate 396, figs. 2, 2a, ♂, 2b, c ♀).

*Tarila Egeon*, Doubleday and Westwood, Gen. D. Lep. ii. p. 422, pl. 69, fig. 2 (1851).

*Dodona Egeon*, Hewitson, Exot. Butt. ii. p. 91 (1861). de Nicéville, Butt. of India, etc. ii. p. 314 (1886).

IMAGO.—Male. Upperside dark ochreous-brown or brownish black, with bright ochreous-yellow markings disposed as in *D. Eugenes*. Cilia slightly edged with ochreous. *Forewing* with the basal area thickly irrorated with brownish-ochreous scales; a transverse broad bright ochreous-yellow band from near end of the cell and extending to the posterior margin; a discal alternated-row of large quadrate spots, the lowest joining the inner band below the submedian vein; followed by an irregular submarginal row of small spots, the upper being minute, the lowest elongated and lunular; beyond are two minute almost white spots before the apex. *Hindwing* with two rather large whitish spots on the costa; a transverse bright ochreous-yellow subbasal band extending from the subcostal across the cell to above anal angle, a slender band across end of the cell, below which it is joined to a broad discal angulated band, followed by a narrow similar submarginal band, and then a marginal lower lunular line; anal lobe and tail black, margined with white. Underside ochreous-red, with silvery-white markings. *Forewing* with silvery-white markings, as on the upperside, but somewhat broader and larger; also with a basal and subbasal band, and a marginal row of small slender spots; all the posterior markings are tinged with un glossed pale yellow, and the interspaces diffusely black patched. *Hindwing* with a silvery-white transverse basal, subbasal, a broad

inner-discal band, a narrow broken medial discal band, and an outer-discal wedge-shaped broad upper band, followed by a submarginal more or less defined double row of lunules, the upper two prominently coalescent and bearing two black spots, the lower inner lunules being inwardly bordered with diffused blackish lunules; the medial discal band is sinuously bent above anal angle and is then continued up the abdominal margin; anal lobe black, edged with white and inwardly again by a zig-zag black line and an upper grey-speckled patch. *Body* above brownish-ochreous, thorax tinged with olive-green; collar and front edged with white; palpi white, the tip ochreous; body beneath and legs white; middle and hind tibiæ and tarsi pale ochreous; antennæ black, annulated beneath with white.

Female. Wings broader; exterior margins more convex. Upperside. Ground-colour duller; markings disposed as in the male, much paler ochreous, broader and larger, and slightly coalescent at their angles. On the forewing there is also a pale ochreous slender discocellular streak, and a marginal row of small linear spots, the two upper being larger and rounded. Underside paler ochreous-red; markings similar to male, but broader and larger.

Expanse ♂  $1\frac{6}{10}$  to  $1\frac{8}{10}$ , ♀  $1\frac{8}{10}$  to 2 inches.

HABITAT.—Kulu; Nepal; Sikkim; Silhet; Khasia Hills; Burma.

DISTRIBUTION.—This is a rare species in collections. General G. Ramsay obtained it in Nepal. Mr. H. J. Elwes possesses "female specimens from Kulu" (P. Z. S. 1891, 209). "Mr. Otto Möller obtained it in Sikkim at 1000 feet elevation, in May, where it is very rare, but is commoner in Bhotan" (de Nicéville, Sikk. Gaz. 1894, 149). A specimen from Silhet is in the Indian Museum, Calcutta; Col. C. Swinhoe records it from the Khasia Hills (Tr. Ent. Soc. 1893, 291). Mr. W. Doherty found it "fairly common in the Karen Hills at 4000 to 5000 feet elevation. It occurs also at Bernardm̄yo" (P. Z. S. 1891, 289). A female, taken in the N. Shan States, in February, is in the British Museum.

#### **DODONA OUIDA** (Plate 397, fig. 1, 1a, b, ♂, 1c, ♀).

*Dodona Ouida*, Moore, Proc. Zool. Soc. Lond. 1865, p. 771. Hewitson, Exot. Butt. iii. part 57.

*Dod.* pl. 1, fig. 4, 5, ♂, 6, ♀ (1866). de Nicéville, Butt. of India, ii. p. 311 (1886). Staudinger, Exot. Schmett. i. pl. 87, ♂ (1888). Leech, Butt. of China, etc. i. p. 292 (1893). Staudinger and Shätz, Exot. Schmett. ii. pl. 40 (1892).

*Toxila Erato*, Boisduval, MS., Moore, Catal. Lep. Mus. E. I. Company, i. p. 243 (1857).

IMAGO.—Male. Upperside dark ochreous-brown or brownish-black; markings dark yellowish-ochreous, of variable width. Cilia greyish-brown, edged with white at the anterior and posterior angles. *Forewing* with three transverse discal equidistant yellowish-ochreous bands which are cut more or less distinctly by the black

veins, the two inner bands placed obliquely outward, the medial one broad, the outer band composed of decreasing dentate spots; before the apex are two superposed white dots. *Hindwing* with two transverse discal angular ochreous bands and two marginal lunular bands, the latter anteriorly bearing two black spots slightly edged with white, the inner discal band being more or less ill-defined; anal lobe black, edged outwardly by a white line and inwardly by a zigzag white line. Underside dark ochreous-red. *Forewing* with the transverse bands, as on upperside, less prominent and pale yellowish-ochreous, terminating on the costal margin in prominent white spots; also two apical white dots; the medial band inwardly black-edged. *Hindwing* with the transverse bands less prominent, bluish-grey, and obscurely bent upward above anal angle to the abdominal margin, the marginal less defined, the medial band inwardly edged with dark purple-brown, the two inner with a white costal spot, the marginal upper black spots being prominent and white-ringed; anal black lobe prominent, edged with white, and above also with a zigzag black line, and black and grey speckled patch.

Female. Upperside paler brown, the base of forewing and the whole ground-colour of the hindwing being somewhat greyish-brown. *Forewing* with a broad outwardly-oblique discal prominent whitish band, and a slender curved submarginal less-defined ochreous lunular band ending on the costa in a white dot; the two apical dots white. *Hindwing* with two marginal pale brownish-ochreous slender lunular bands interspaced with dark brown, and two upper black spots; anal lobe black, edged with white. Underside paler than in male; base of forewing, and the hindwing tinged with grey. *Forewing* with a broad white oblique discal band, as on upperside, the submarginal slender band greyish-white but ill-defined and with its two costal and also the two apical spots prominently white; the inner-discal oblique slender band, as in male, is ill-defined and greyish-white. *Hindwing* with markings as in male, but less defined.

Expanse, ♂  $1\frac{8}{10}$  to  $1\frac{9}{10}$ , ♀  $1\frac{8}{10}$  to 2 inches.

HABITAT.—W. and E. Himalayas; Assam; Silhet; Khasia Hills; Burma; W. China.

DISTRIBUTION.—“This is a widely-distributed species, occurring at Masuri, in Sikkim, Bhotan, and eastward to Upper Assam” (de N. *l.c.* 311). Major H. B. Hellard obtained it at “Masuri in October” (MS. Notes). Capt. A. M. Lang took it at Masuri, 7000 feet elevation, in April, May, and June. It was rather abundant in April, 1868, flying very rapidly to and fro, and pitching with wings partially open and but half erect, on sprays of rose, currant, cypress, and walnut, generally the latter. All but one seen by me on these days (18th to 22nd) were males. I took, however, one female in coitu” (MS. Notes, p. 197). We possess examples from Naini Tal, Nepal, Darjiling, Bhotan, and Khasia Hills, the latter taken by

Major Godwin-Austen. It "occurs in Sikkim from 3000 to 10,000 feet elevation, and is not rare, flying throughout the warm months from March to September" (de Nicéville, Sikk. Gaz. 1894, 149). Mr. H. J. Elwes (Tr. Ent. Soc. 1888, 370) says that, in Sikkim, "it frequents more open places than *D. Dipæa*, settling with open wings on branches of trees, and flying back to the same perch when disturbed." Mr. G. C. Dudgeon took it in Bhotan in June. Col. C. Swinhoe records it from the Khasia Hills (Tr. Ent. Soc. 1893, 291). Mr. W. Doherty took it in the Karen Hills (P. Z. S. 1891, 238). Dr. N. Manders obtained it in the "Northern and Southern Shan States" (Tr. Ent. Soc. 1890, 526). Mr. J. H. Leech records it from Moupin and Omeishan, W. China (*l.c.* 292).

**DODONA ADONIRA** (Plate 397, figs. 2, 2a, ♂, 2b, c, ♀).

*Dodona Adonira*, Hewitson, Exotic Butt. iii. *Dod.* pl. 1 fig. 1, 2, ♂ (1866). de Nicéville, Journ. As. Soc. Bengal, 1883, p. 95; Butt. of India, etc. ii. p. 312 (1886).  
*Tarila Fatua*, Boisduval MS. Moore, Catal. Let. Mus. E. I. C. i. p. 243 (1857).

**IMAGO.** Male. Upperside dark ochreous-brown or brownish-black; cilia edged with greyish-brown. *Forewing* with the basal area thickly irrorated with brownish-ochreous scales; crossed by three discal dark yellowish-ochreous bands cut by the veins, the inner band even and extending from close to the costa near end of the cell to the submedian interspace, the middle band with its portion between the middle and lower median veinlets disposed inwardly and out of line, the lower portion being joined to the lower end of the inner band; outer band narrower and either entire or lunularly-macular, its lower end curved inward. *Hindwing* with two rather large ochreous-white spots on the costa; crossed by three dark yellowish-ochreous bands from the subcostal, the inner-discal band less-defined, the medial band being either bifid anteriorly from the middle median branch, or the outer portion is there disconnected and then forms an upper short band, the third band is submarginal; beyond is a marginal lower lunular line; the outward bands bent upward above anal angle and then extended imperceptibly up the abdominal margin; sometimes two or three superposed apical small ochreous-speckled spots are present; anal lobe with a duplex jet-black spot outwardly edged by a fine white line and bordered above by black spots. Underside pale yellowish-ochreous, suffused with brighter ochreous at the posterior angles. *Forewing* crossed by a black slender basal, subbasal, two inner-discal, a short upper medial-discal, an outer-discal, a submarginal, and then an extreme outer marginal band; these bands, except the short upper medial, being continued across the hindwing to above the anal angle, and end in a zigzag series of black spots; anal lobe with prominent duplex black spot.

Female. Upperside with the transverse bands, as in male, but broader and

paler. *Forewing* with, or without, a marginal apical row of small ochreous spots, and a slightly-defined discocellular streak. Underside as in the male, but paler.

Expanse, ♂  $1\frac{6}{10}$  to  $1\frac{8}{10}$ , ♀  $1\frac{6}{10}$  to 2 inches.

HABITAT.—Eastern Himalayas; Khasia and Naga Hills; Upper Burma.

DISTRIBUTION.—We possess examples from Nepal, taken by Gen. G. Ramsay; from Bhotan, taken by Mr. G. C. Dudgeon, in February and May. Mr. L. de Nicéville records it as being “found in Sikkim between 5000 and 9000 feet elevation, never commonly east of the Tista river. It is a forest butterfly. I have caught it in October, but it probably flies all through the summer. It is much less rare in Bhotan and Daling” (Sikk. Gaz. 1894, 149). Mr. H. J. Elwes says it is “a rare species in Sikkim, occurring on paths in dense forest at 7000 to 9000 feet, in the rainy season. It flies fast, and settles on the ground” (Tr. Ent. Soc. 1888, 371). Col. C. Swinhoe records several examples from the Khasia Hills (Tr. Ent. Soc. 1893, 291). Mr. W. Doherty records it as “occurring in the Naga Hills at 5000 to 6000 feet, but not commonly. A single specimen, also taken at Bernardmyo” (P. Z. S. 1891, 288). Mr. L. de Nicéville records “a pupa of this species, found at Darjiling by Mr. A. V. Knyvett on *Mæsa Chisia*, attached to a leaf in exactly the same way as in *Z. Flegyas*, i.e. by the tail and a median girth” (Proc. As. Soc. Beng. 1890, 138).

CHINA AND INDO-MALAYAN SPECIES.—*Dodona Sinica* (*Dodona Durga*, var. Leech, Butt. of China, i. p. 290, pl. 28, fig. 3, ♂). *Habitat.* W. China.—*Dodona albescens* (*D. Durga*, var. *albescens*, Oberthür, Etudes Entom. xx. p. 29, pl. 9, fig. 166, ♂ (1896). *Habitat.* E. Tibet.—*Dodona Maculosa*, Leech, Entom. 1890, p. 44; Butt. of China, i. p. 292, pl. 28, fig. 1, ♂ (1893). *Habitat.* W. and C. China.—*Dodona Elvira*, Staudinger, Deuts. Ent. Zeit. 1896, p. 239, pl. 5, fig. 6, ♂. Grose-Smith, Rhop. Exot. Dic. pl. ii. fig. 12, 13, ♀ (1901). *Habitat.* Borneo.

#### Genus BALONCA.

*Dodona* (part), de Nicéville, Butt. of India, etc., ii. p. 309 (1886).

IMAGO.—*Forewing* triangular; cell broad; middle median emitted at some considerable distance before lower end of the cell. *Hindwing* much produced posteriorly; exterior margin very oblique, acutely scalloped, with an elongated slender tail at end of the submedian vein, and a rounded lobe projecting prominently hindward below the tail and anal angle; precostal vein emitted at some distance above the junction of the subcostal; the subcostal branch emitted at some considerable distance before end of the cell. Frontal tuft thick and densely clothed;

palpi shorter and stouter than in *Dodona*, the second joint only reaching the front, the apical joint short and stout; antennal club elongated.

TYPE.—B. Deodata.

**BALONCA DEODATA** (Plate 398, fig. 1, 1a, ♂).

*Dodona Deolata*, Hewitson, Entom. Monthly Mag. xiii. p. 151 (1876); *id.* *Desc. Lep.* Coll. Atkinson, p. 3, pl. 1, fig. 1, ♀ (1879). de Nicéville, Butt of India, etc., ii. p. 312 (1886). Elwes, Proc. Zool. Soc. 1891, p. 228, pl. 27, fig. 8.

IMAGO.—Male and female. Upperside. Both wings with the outer third deep fuliginous-black; the basal third fuliginous-grey, the latter with two transverse subbasal, more or less apparent, paler grey narrow bars; the medial third of the wings being creamy-white and forming a broad transverse outwardly-oblique discal band, which widens and curves outward from the costa of forewing and decreases to a point on the hindwing in the lower median and submedian interspace, from whence it is obsolescently continued and bent inward to the abdominal margin in a broken series of ill-defined grey lunules. *Forewing* also with three inner subapical obliquely superposed white spots, the upper one being transversely elongated or broken, and the lower one much smaller, followed by three outer apical smaller spots, and then by a submarginal upper row of minute spots and a marginal row of slightly-defined pale greyish-brown lunules, the upper two or three of the latter sometimes being more distinct and whitish. Cilia brown. *Hindwing* also with two, more or less slightly-defined, submarginal pale greyish-brown lunular lines, the outer line being most distinct and white posteriorly, followed by a more prominently distinct marginal white lunular line; the anal lobe black irrorated with white scales and encircled by a fine white line; tail black. Cilia white. Underside. Both wings with the outer and basal ground-colour rich purplish-red, the medial discal broad band, basal transverse bands, and the outer markings, very prominent and glossy-white. *Forewing* also with the basal and outer interspaces from the lower median to posterior margin suffused with black. *Hindwing* also with the interspaces between the middle median and submedian ochreous-yellow and bordered by black spots; anal marginal interspaces black streaked; anal lobe black. *Body* above greyish-brown, beneath white; head ochreous, front white streaked; palpi white, tip brown; legs white, middle and hind tibiæ and tarsi pale ochreous; antennæ black, tip ochreous.

Expanse, ♂ ♀  $1\frac{6}{10}$  to  $1\frac{8}{10}$  inch.

HABITAT.—Lower Burma.

DISTRIBUTION.—The type specimen, a female, in the Hewitsonian collection, is recorded from Moulmein. Mr. H. J. Elwes records "several specimens taken in March and April by Mr. W. Doherty in the Karen Hills, East Pegu, at 4000 to

5000 feet elevation" (P. Z. S. 1891, 288). A male from E. Pegu, taken by Mr. Doherty, in Mr. F. Goodman's collection, is illustrated on our Plate 398, figs. 1, 1a. We possess two damaged males, taken in the Upper Mekong Valley, Shan States, Burma, by Mr. R. Roberts, C.E. A male, from Mongpu, Siam frontier, Shan States, 2500 feet elevation, from Capt. E. Y. Watson's collection, is in the British Museum. A male, from "Burma," is also in the late Mr. P. Crowley's Collection.

**BALONCA BINGHAMI** (Plate 398, fig. 4, ♂).

Male. Upperside. Differs from *Deodata* in the broader creamy-white medial discal area on both wings, and having very much paler and less-defined grey basal bands. *Forewing* with three inner-subapical white spots, below which is a broad lunule at the posterior angle, followed by a single upper or a row of three very small outer apical spots. *Hindwing* with a black submarginal band entirely separated from the narrow marginal linear band, and ending posteriorly in a few black spots interspaced with ochreous. Underside with pale chocolate bands; the broad medial area as on upperside.

Expanse, ♂  $1\frac{7}{10}$  to  $1\frac{8}{10}$  inch.

HABITAT.—Burma.

DISTRIBUTION.—A male, labelled "Burma," taken by Capt. C. T. Bingham, and two males from Capt. E. Y. Watson's collection, are in the British Museum.

**BALONCA LONGICAUDATA** (Plate 398, fig. 2, 2a, ♂).

*Dodona longicaudata*, de Nicéville, Proc. As. Soc. Bengal, 1881, p. 121; *id.* Butt. of India, etc., ii. p. 313, pl. 24, fig. 117, ♂ (1886).

IMAGO.—Male. Upperside. Both wings deep brown. *Forewing* with a transverse outwardly-oblique medial-discal creamy-white rather narrow band, but which does not reach the costa, being narrowest at that point, and there divided by the veins into two very small spots; this band has its inner edge almost straight, its outer edge convex; an incipient very small white inner subapical upper spot is more or less apparent, two lower small oblique spots, a submarginal upper row of very small spots, and a marginal row of small pale lunular spots. *Hindwing* with a transverse medial-discal creamy-white band, which is broadest at the costal end, decreasing posteriorly and ending in a broken point at or beyond the lower median branch; abdominal margin paler brown, with an indistinct greyish-white streak from the base, and another short transverse streak ascending above the anal angle; two submarginal incomplete pale lunular lines, and a distinct white marginal line; anal lobe black, thickly irrorated with white scales and encircled by a fine white line; tail long, black. Cilia white. Underside rich purplish-red. *Forewing* with a

very prominent glossy-white transverse medial band, as on the upperside, but reaching the costa; two basal narrow bands, a short narrow costal streak beyond, then a very irregular broken macular submarginal band, a marginal row of small lunules and two upper apical rounded spots; the ground-colour near posterior angle being almost black. *Hindwing* with a glossy-white medial band and two basal narrow bands meeting above anal angle, at which point they are joined by two other white narrow bands ascending the abdominal margin; there is also a slender upper inner-submarginal streak and a bifid outer-submarginal line, followed by a lower marginal line, the two latter widening out over the anal area, which latter also is interspaced with ochreous-yellow and black spots speckled with white scales; the anal lobe and tail being also black and margined with white.

Expanse, ♂  $1\frac{8}{10}$  inch.

HABITAT.—Shillong, Khasia Hills.

DISTRIBUTION.—The type specimens, two males, taken in Shillong in July and November, are in the Indian Museum, Calcutta, and Major Marshall's collection (de N. l.c. 313). A male, without locality, is in Mr. F. Goodman's collection, and from which latter our illustrations on Plate 398, figs. 2, 2a, are taken.

**BALONCA ANGELA** (Plate 398, figs. 3, 3a, ♂, 3b, c, ♀).

*Dodona Angela*, Grose-Smith, Rhop. Exotica, Dic. pl. 2, figs. 10, 11, ♂ (Feb. 1901).

IMAGO.—Male. Upperside very pale creamy-yellow. *Forewing* with a basal and subbasal very slightly-defined greyish narrow band and a discal outwardly-oblique similar coloured irregular fascia, which latter ends on the costa in a square black patch; the apex beyond is broadly black, enclosing three superposed rounded spots of the ground-colour, the lowest spot being incomplete; the black colour then continues decreasingly down the outer margin. *Hindwing* with a basal and subbasal and an outer-discal very slightly-defined narrow greyish band, followed by a black slender broken submarginal and then an angled marginal lunular line; anal lobe with a black spot. Underside silky-white, with the markings as above, chocolate-brown or dark ochreous-brown, the lower short streak above posterior angle and the lower portion of marginal line of the forewing, spots and short streaks above anal angle and anal lobe of the hindwing being black, the interspaces above the lobe being also slightly tinged with ochreous-yellow.

Female. Upperside pale yellow or creamy-white. Both wings with similar markings as in the male, except that, on the forewing, the discal oblique irregular band is entirely black, and on the hindwing, the outer discal band is also entirely black. Underside silky-white, with markings as in the male, but of a darker chocolate-brown.



Expanse, ♂  $1\frac{8}{10}$ , ♀ 2 inches.

HABITAT.—Tenasserim.

DISTRIBUTION.—The type specimen, a male, in the collection of Mr. H. Grose-Smith, was taken by Mr. T. A. Hauxwell at Thoundaung, Tenasserim, 3500 feet elevation, in February. A much-damaged specimen of a female, without known locality, is in Col. C. Swinhoe's collection, and from which our figures 3b, 3c, are taken.

INDO-MALAYAN SPECIES.—*Balonca Nicévillei* (Dodona Nicévillei, Dohrn, Stett. Ent. Zeit. 1899, p. 245, pl. 1, fig. 1. *Habitat.* Sumatra.—*Balonca Windu* (Dodona Windu, Fruhstorfer, Berl. Ent. Zeit. 1894, p. 241, pl. 17, fig. 2. *Habitat.* Java.—*Balonca Fruhstorferi* (Dodona Fruhstorferi, Röber, Entom. Nachr. 1897, p. 5). *Habitat.* W. Java.—*Balonca Pryeri*. Female. Upperside pale creamy-white, basal grey bands very indistinct. *Forewing* with broader black outer border than in *Deodata*, and bearing only two rounded white spots. *Hindwing* with broader outer discal black band than in *Deodata*, which is partly joined anteriorly to the submarginal lunular line. Underside. Markings similarly disposed as in *Deodata*. *Forewing* with the white submarginal and marginal band broader. *Hindwing* with the submarginal chocolate band broader. Expanse  $1\frac{6}{10}$  inch. *Habitat.* Sandakan, N. Borneo (W. B. Pryer); type in Coll. British Museum.—*Balonca Henrici* (Dodona Henrici, Holland, Trans. Ent. Soc. Amer. 1887, p. 119, pl. 2, fig. 2). *Habitat.* Hainan.—*Balonca Aponata* (Dodona Aponata, Semper, Reis. Phil. Lep. p. 156, woodcut (1889). *Habitat.* S. Mindanao.

### Genus SOSPITA.

*Sospita*, Hewitson, Exotic Butt. ii. p. 91 (1861). Herr.-Schæffer, Exot. Schmett. pt. 37 (1861).

*Abisara* (part), de Nicéville, Butt. of India, etc., ii. p. 319 (1886).

IMAGO.—Male. *Forewing* triangular; costa slightly arched, apex pointed, exterior margin oblique and slightly waved; cell very large and broad; costal vein stout, extending to beyond middle of the margin and bent upward near its end; first and second subcostal branches emitted before end of the cell, both short, third branch at about one-third beyond the cell, fourth at nearly two-thirds and ending at the apex, fifth ending below the apex; upper discocellular obsolete, middle and lower long and deeply concave; upper radial emitted in a line from the subcostal, lower from middle of discocellulars; middle median emitted at some distance before lower end of the cell; submedian slightly recurved. *Hindwing* short, broad, subovate; costal margin broadly arched from the base and thence oblique, the apex rounded, exterior margin convex and slightly scalloped, with a tendency to an angle at end of upper median veinlet—more distinctly so in the female; cell long, broad

across the middle ; precostal vein curved outward ; costal vein rather short ; first subcostal branch emitted at some distance beyond end of the cell ; discocellulars very long and outwardly oblique, upper shortest and starting from the subcostal opposite to half the lower length of the cell ; middle median branch emitted at some distance before lower end of the cell. Thorax somewhat stout, abdomen moderate sized ; head broad ; eyes hairy ; antennæ more than half length of wing, distinctly annulated, club elongatedly-spatulate ; palpi small, short, not reaching front of head, smoothly scaled at the sides, roughly scaled beneath, apical joint minute ; *forelegs of male* small, densely clothed with fine hairs ; *forelegs of females* rather long, slender, scaled ; tarsus five-jointed, and with two terminal lateral spines, fifth joint armed with two slender lengthened projected claws, broad paronychial, and small pulvillus.

TYPE.—S. Fylla.

**SOSPITA FYLLA** (Plate 399, figs. 1, 1a, ♂, 1b, c, ♀).

*Taxila Fylla*, Doubleday, List Lep. Brit. Mus. pt. 2, p. 2 (1847) ; Westwood, Gen. D. Lep. ii. p. 422, pl. 69, fig. 3, ♂ (1851).

*Sospita Fylla*, Hewitson, Exot. Butt. ii. p. 91 (1861).

*Abisara Fylla*, de Nicéville, Butt. of India, etc., ii. p. 321 (1886).

IMAGO.—Male. Upperside. Both wings rich dark vinaceous-brown. Cilia of forewing alternately edged with white at the apex and at posterior angle, and of the hindwing at the apex. *Forewing* crossed by a discal outwardly-oblique straight even straw-yellow band, which extends from close to the costal edge to above the posterior angle, its lower portion being narrowest and slightly recurved ; beyond is a sub-marginal curved obscure pale brown lunular line, which generally bears anteriorly two minute white dots divided by the fourth subcostal branch, two additional white dots also present before the apex divided by the fifth subcostal branch. *Hindwing* crossed by an obscure pale brown curved medial-discal lunular line, a marginal series of seven black spots inwardly edged with pale brown, and anteriorly bearing a pure white dot, the upper of these black spots is either much the smallest or is often obsolescent or quite absent, the two next spots are the largest and prominent, the two following being smaller and more or less obsolescent, the last two are small and prominent. Underside. Both wings much paler, duller umber-brown, but similarly marked, except that the band on the forewing is slightly paler yellow, and the hindwing has a faintly-defined subbasal line.

Female. Upperside much paler and duller coloured than in male, but similarly marked. Cilia of both wings alternated with white. *Forewing* broader, the apex less produced ; the discal band being broader anteriorly, narrower posteriorly, and

pure white—or very slightly tinged with palest yellow—and reaches the extreme costal edge. *Hindwing* with the exterior margin more angular in the middle; marginal black spots somewhat larger. Underside. Ground-colour as in male; the white band on forewing, and the markings, as on upperside. *Body* and palpi above brown; collar and sides of front edged with white; body and legs beneath paler brown; antennæ black, annulated with white, club white tipped with red.

Expanse, ♂  $1\frac{8}{10}$  to  $2\frac{4}{10}$ , ♀ 2 to  $2\frac{4}{10}$  inches.

HABITAT.—W. and E. Himalayas; Assam; Silhet; Naga and Khasia Hills; Burma; Upper Tenasserim.

DISTRIBUTION.—In the Western Himalayas this butterfly “occurs in Masuri and the Dehra Dhun. Mr. W. Doherty took it at Askot, the Dhoaj, Eastern Kumaon, at 4000 to 7000 feet elevation. It is common in Sikkim, in Buxa, Bhotan, and in Assam, the Naga Hills, Cherra Punji, and Silhet. It was taken by Capt. C. T. Bingham in the Upper Thoungyeen forests, Upper Tenasserim in March (de N. l.c. 321). We possess examples from Sikkim, the smallest specimens having been taken in May and the largest in November. “It occurs commonly in Sikkim, at low elevations throughout the warm months” (de Nicéville, Sikk. Gaz. 1894, 149). Col. C. Swinhoe records it from the Khasia Hills (Tr. Ent. Soc. 1893, 290). Signor L. Fea took it at Caboga, Karen Hills, in September (MS. note). Mr. W. Doherty found it “abundant in the Naga Hills, also in East Pegu and the Bernardmyo District” (P. Z. S. 1891, p. 287). Col. C. H. E. Adamson records it as “not uncommon in the Hills north of Bhamo. A single pair also taken in the Eastern Shan Hills at 4000 feet, in March” (List, 1897, 28). Dr. N. Manders obtained it at “Bernardmyo, and in the Southern Shan States” (Tr. Ent. Soc. 1890, 526).

**SOSPITA NEOPHRON** (Plate 400, figs. 1, 1a, b, c, ♂, 1d, ♀).

*Sospita Neophron*, Hewitson, Exotic Butt. ii. *Sosp.* pl. 1, fig. 3 (1861).

*Abisara Neophron*, de Nicéville, Journ. As. Soc. Beng. 1886, p. 253, pl. 21, fig. 8, ♂; Butt. of India, etc., ii. p. 321 (1886). Distant, Rhop. Malay. p. 449, pl. 36, fig. 6 (1886).

IMAGO.—Male. Upperside rufescent-brown, varying from a uniform dark tint to a paler or more greyish-brown. *Forewing* crossed by a discal outwardly-oblique broad white band, commencing at or close to the costal margin, extending almost straight, or in a very slightly-recurved course, and decreasing to a point before the posterior angle, followed by a submarginal straight obscure pale rufescent-grey line, which is generally most distinct and whitish posteriorly, this line being sometimes (probably in the dry-season brood) diffused and less defined; beyond are marginal lower slender whitish lines interspaced with black. Cilia brown, edged with white posteriorly. *Hindwing* crossed by an obscure pale rufescent-grey outer-discal

narrow waved lunular fascia, which is bent upward from the submedian to the abdominal margin, this fascia is widest anteriorly, and its inner edge is also sometimes somewhat sinuous; followed by a submarginal series of seven spots, each being outwardly-edged by a white line and inwardly by pale rufescent-grey, the three upper spots are black, the upper one linear or obsolescent, the second and third large, prominent, and somewhat broadly conical, the third being bordered on each side along the vein by an orange line, the lower four are blackish-brown, sometimes obsolescent, and longitudinally oval, the lowest being narrow; beyond is a marginal slender white line; tail and its cilia white. Cilia from the apex to upper median veinlet white. Underside brighter rufescent-brown than on upperside, palest and greyish tinged basally; markings the same and all very prominent, the outer white fasciæ purpurescent-grey. Some specimens, probably dry-season, have the outer markings, on both wings, on the upper and underside, much less defined or obsolescent, the two upper black spots on hindwing, only, being prominent.

Female. Upperside. Ground-colour somewhat paler; markings the same as in male, except that the discal white band on the forewing is usually broader and always starting from the costal edge. Underside as in the male.

Expanse, ♂ ♀ 2 to 2 $\frac{1}{10}$  inches.

HABITAT.—Nepal; Sikkim; Bhotan; Assam; Naga and Khasia Hills; Upper and Lower Burma; Tenasserim; Malay Peninsula.

DISTRIBUTION.—Specimens from Nepal, taken by Gen. G. Ramsay, are in our possession. "It is not uncommon in Sikkim. It occurs also in Assam, Sibsagar, the Naga Hills, and Silhet" (de Nicéville *l.c.* 321). "Met with in Sikkim at low elevations only, from March to November" (*id.* Sikk. Gaz. 1894, 149). Mr. G. T. Dudgeon obtained it in Bhotan. Col. C. Swinhoe records it from the Khasia Hills (Tr. Ent. Soc. 1893, 291). Mr. W. Doherty obtained it in the "low country of East Pegu, in March and April" (P. Z. S. 1891, 286). Col. C. H. E. Adamson took it in the Arakan Hills, in April, and found it not uncommon near Bhamo in April, May, June, and also in November" (List, 1897, 28). Signor L. Fea took specimens at Caboga, Karen Hills, in September. Mr. O. Limborg found it at "Moolai, Upper Tenasserim, from 3000 to 6000 feet" (P. Z. S. 1878, 833). Dr. N. Manders found it "more common in the Northern and Central Shan States. I have never taken it at Fort Stedman or Koni, but have specimens taken at Banzam and Thebaw, in the cold weather" (Tr. Ent. Soc. 1890, 526).

Mr. W. L. Distant records it from Perak, Malay Peninsula (*l.c.* 449).

**SOSPITA CHELA** (Plate 399, figs. 2, 2a, 2b, ♂, 2c, ♀).

*Abisara Chela*, de Nicéville, Journ. As. Soc. Bengal, 1886, p. 252, pl. 11, fig. 7, ♂; *id.* Butt. of India, etc., ii. p. 322 (1886).

IMAGO.—Male. Upperside dark fuscous-brown. *Forewing* crossed by a discal outwardly-oblique white band, which is variable in width, and more or less slightly recurved, followed by a submarginal narrow white line, which is distinct throughout its length in some specimens, in others it is sullied with pale brown along the middle, but always ending in a distinct white spot on the costa; beyond is one, or two marginal short fine white lines above the posterior angle. *Hindwing* crossed by an obscure whitish or pale brown outer-discal narrow angulated lunular fascia, which is bent upward anteriorly and outward at the middle median veinlet, followed by a submarginal series of spots and marginal line, similar to those in *S. Neophron*; the outer portion of all the veins ochreous. Underside. Both wings much paler and of a more rufescent-brown colour; all the markings more distinct, the outer white fascia being pale purpurescent-grey. *Forewing* with the discal and submarginal band much broader than on upperside, the latter prominent throughout its length. *Hindwing* marked as on the upperside; in some specimens the space from the discal angulated fascia to the outer spots is more or less, or entirely irrorated with purpurescent-grey scales; tail white, shorter than in *S. Neophron*.

Female. Upperside. Both wings paler than in the male, and of a more rufescent-brown colour, the discal white band on the forewing somewhat broader, the outer portion of veins on hindwing ochreous. Underside brighter rufescent-brown than in the male; markings the same.

Expanse, ♂ ♀  $1\frac{6}{10}$  to  $1\frac{8}{10}$  inch.

HABITAT.—Sikkim; Silhet; Naga and Khasia Hills.

DISTRIBUTION.—“Occurs in Sikkim in the same places and in the same months as *S. Neophron*. Mr. Otto Möller obtained numerous specimens at low elevations” (de Nicéville *l.c.* 322). Mr. W. Doherty took it in the Naga Hills at 3000 feet (P. Z. S. 1891, 286). Colonel C. Swinhoe has numerous examples from Cherra Punji and Khasia Hills.

Of our illustrations on Plate 399, figs. 1, 1a, b, are males, and 1c, a female, and on Plate 400, figs. 2, 2a, is a variety of the male, from Silhet, in which the white recurved band on forewing is narrow, and on the hindwing the two ordinary upper black spots are coalesced, on both the upper and underside of the wing.

CHINA AND MALAY SPECIES.—*Sospita Fylloides*. Both sexes differ from *Fylla* in their smaller size, the male having a narrower yellow band on the forewing, the females also have a narrow or much narrower whitish band. On the upperside of both sexes, the ground-colour is darker, and the ordinary outer pale fascia is less apparent or quite obsolete. Expanse, ♂ ♀  $1\frac{6}{10}$  to  $1\frac{8}{10}$  inch. *Habitat*. W. China.—*Sospita Savitri* (Abisara Savitri, Felder, Wien. Ent. Monat. iv. p. 397 (1860). Distant, Rhop. Malay. p. 189, pl. 18, fig. 5, ♀ (1883). Staudinger, Exot. Schmett. i.

p. 239, pl. 87, ♂ (1888). *Syn.* *Sospita Susa*, Hewitson, Exot. Butt. ii. *Sosp.* pl. i. fig. 2 (1861). *Habitat.* Malay Peninsula.—*Sospita Aita* (Abisara Aita, de Nicéville, Journ. Bombay N. H. Soc. 1893, p. 49, pl. 1, fig. 10, ♂; *id.* Journ. As. Soc. Bengal, 1895, p. 441. *Habitat.* Sumatra.—*Sospita Atlas* (Abisara Atlas, de Nicéville, Journ. Bombay N. H. Soc. 1895, p. 268, pl. N, figs. 10, 11, ♂ ♀. *Habitat.* Java.

#### GENUS ABISARA.

*Abisara*, Felder, Wien. Ent. Monats. iv. p. 397 (1860). Butler, Journ. Linn. Soc. Zool. ix. p. 413 (1867). Moore, Lep. of Ceylon, i. p. 68 (1881). Staudinger and Schätz, Exot. Schmett. ii. p. 231, pl. 40 (1892).

*Abisara* (part), Distant, Rhop. Malayana, p. 188 (1883). de Nicéville, Butt. of India, etc., ii. p. 319 (1886).

*Sospita* (part), Hewitson, Exot. Butt. ii. p. 91 (1861).

IMAGO.—Male. *Forewing* triangular; costal margin arched, apex obtusely pointed, exterior margin oblique and even, posterior angle obtuse; costal vein extending nearly two-thirds the margin; first and second subcostal branches very short, emitted near together close before end of the cell, third branch at one-third beyond the cell, fourth and fifth at two-thirds, the fourth ending at apex; cell very broad; discocellulars concave, of equal length; upper radial from end of cell in a line with subcostal, lower radial from middle of the discocellulars; middle median branch emitted at a short distance before lower end of the cell, lower median at half length of the cell; submedian slightly recurved. *Hindwing* short, broad; costal margin very much arched at the base and thence oblique, exterior margin broadly and obtusely angled outward between upper and lower medians—more prolonged and pointed in the female; abdominal margin long, anal angle rounded; costal vein very short; precostal vein outwardly curved, emitted at some distance above the juncture of subcostal; cell long, narrow; subcostal branches emitted beyond end of the cell; discocellulars very long and oblique, of equal length, upper slightly concave, lower straight; middle median branch emitted at a short distance before lower end of the cell, lower branch from opposite to half length of upper discocellular; submedian vein straight; internal vein recurved. *Body* of moderate size; palpi very small, porrect, not projecting beyond the eyes, slender, compactly pilose, apical joint very short, pointed; eyes hairy; antennæ slender, with a well-formed lengthened spatulate club; *forelegs of male* small, clothed with fine silky hairs; *forelegs of female* slender, smoothly scaled, terminal joint with two short claws, small paronychia and pulvillus.

LARVA.—“Flat, very broad in the middle, tapering to both ends; clothed sparsely with short hairs.”

PUPA.—“ Very similar to the larva. Attached to a leaf by the tail and a girdle ” (Davidson and Aitken, Journ. Bombay N. H. S. 1890, 352).

TYPE.—A. Kausambi.

**ABISARA KAUSAMBI** (Plate 401, figs. 1, 1a, ♂, 1b, c, ♀).

*Abisara Kausambi*, Felder, Wien. Entom. Monats. iv. p. 397 (1860). Butler, Trans. Linn. Soc. Zool. 1877, p. 545. Distant, Rhop. Malayana, p. 189 (♀ only), pl. 18, fig 11, ♀ (1883). Moore, Journ. Linn. Soc. Zool. 1886, p. 38.

IMAGO.—Male. Upperside rich dark purple-brown. *Forewing* with two parallel transverse discal narrow paler purplish fasciæ, the inner one sinuously-edged, the outer one even posteriorly, but anteriorly more or less diffused obliquely-inward and there somewhat whitish tinged; followed by a slender submarginal line which is anteriorly obsolescent. *Hindwing* with a less apparent pale inner-discal angular fascia; a submarginal fascia bearing a row of two anterior and two subanal black spots edged by a fine white line, followed by a marginal slender pale lunular line. Underside rich dark reddish-purple. *Forewing* with the two discal fasciæ and submarginal line more prominent, paler and of a bluish-violet colour, followed by a more slender outer marginal line. *Hindwing* with the discal angulated fascia and marginal line paler and bluish-violet; with three upper and two lower submarginal prominent black spots distinctly edged with bluish-white, and between the spots in the median interspaces are a pair of pale violet lunules enclosing two conical spots of the ground-colour.

Female. Upperside paler, but of a more reddish-purple colour. *Forewing* with the discal fasciæ and two marginal lines more distinctly defined, the oblique anterior portions of the discal fasciæ widely coalesced and prominently whitish. *Hindwing* with the discal angulated fascia and outer markings more prominent than in male. Underside with similar markings as in the male, the oblique anterior portion of the fasciæ on forewing distinctly coalesced, prominent and whitish.

Expanse, ♂  $1\frac{8}{10}$ , ♀  $1\frac{8}{10}$  to  $2\frac{1}{10}$  inches.

HABITAT.—Lower Burma; Tenasserim; Malay Peninsula; Singapore; Sumatra; Java; Borneo.

DISTRIBUTION.—We have verified specimens of both sexes which were taken by Dr. J. Anderson in the Mergui Archipelago—at “Pataw Island, December; Sullivan Island, January; King Island, January and February, and Elphinstone Island in March” (Proc. Linn. Soc. Zool. 1886, 38). A female, from Rangoon, is in Mr. F. Godman’s collection. Mr. Distant records it from the Malay Peninsula and Singapore. Specimens from Malacca, Sumatra, Borneo and Java, are in our own collection, and that of the British Museum.

## ABISARA ANGULATA.

*Abisara angulata*, Moore, Proc. Zool. Soc. Lond. 1878, p. 883. de Nicéville, Butt. of India, etc., ii. p. 323 (1886).

*Wet-season brood* (Plate 401, figs. 2, 2a, ♂, 2b, c, ♀).

IMAGO.—Male. Upperside dark purple-brown. *Forewing* with a transverse paler inner-discal broad angulate fascia, an outer-discal narrower lunular fascia, and a slender submarginal line. *Hindwing* with a less-defined pale transverse discal angular fascia, a submarginal series of somewhat large dusky conical pale-bordered spots, the upper and lower pair being prominently black and outwardly white-edged, followed by a marginal pale lunular line; discocellular streak black. Underside rich dark purplish-red, the veins being outwardly pale lined. *Forewing* with the transverse fasciæ, as on upperside, prominent and pale purplish-white or dull purplish-grey. *Hindwing* with prominent angular discal broad lunular fascia, edges of the submarginal conical spots, and the marginal line pale purplish-white or dull purplish-grey; the three upper and two subanal spots very prominently black and outwardly edged with white.

Female. Upperside paler and of a more reddish-brown colour; transverse markings similar to the male, but more distinctly defined and paler, the fasciæ on forewing being most prominent and more or less sullied with brownish-white; inner edge of discal fascia sharply defined. Underside paler and redder; markings as in the male.

Expanse, ♂  $1\frac{6}{10}$  to  $2\frac{1}{10}$ , ♀  $1\frac{8}{10}$  to 2 inches.

*Dry-season brood* (Plate 401, figs. 2d, e, ♂ ♀).

Male. Upperside darker, or more ochreous-brown than in wet form; markings similar; the fasciæ on forewing more or less diffused, the inner edge of discal fascia dusky; marginal spots on the hindwing more or less obsolescent. Underside paler and more brownish; markings similar to the wet form, but less defined and narrower, the marginal black spots on hindwing much smaller or obsolescent.

Female. Upperside ochreous-brown, palest on both wings beyond the sharply-defined angulated edge of the discal fascia, the upper end of which is still paler; outer markings obsolescently diffused; marginal spots on the hindwing very small, the lower pair obsolescent. Underside. Ground-colour paler; markings more or less similar to those of the upperside.

Expanse, ♂ ♀  $1\frac{7}{10}$  to  $1\frac{8}{10}$  inch.

HABITAT.—Lower Burma; Upper Tenasserim.

DISTRIBUTION.—“A very common insect in Burma all the year round” (Col. C. H. E. Adamson, List, 1897, 28). Signor L. Fea took it at “Palone in August,



and at Cobapo, Karen Hills, in November" (MS. Notes). Specimens are recorded from Tavoy (J. As. S. Beng. 1887, 428). The type specimens were taken by Mr. Oito Limborg at Ahsown, Hatseiga, and on the road from Naththoung to Paboga, Upper Tenasserim. We possess specimens of the *wet form* from Rangoon, and Ahsown (type); Toungoo; Palin, April; and of the *dry form* from Rangoon and Toungoo. Col. Adamson has the *wet form*, taken in Moulmein in June, and a female from Akyab taken in October. In the British Museum are both sexes of the *wet form* from Beeling, Upper Tenasserim, March; Sittang, January; Yedu, November, and of the *dry form* from Tiling Yaw, March and April, taken by Capt. E. Y. Watson.

### ABISARA PRUNOSA.

*Wet-season brood* (Plate 402, figs. 1, *larva* and *pupa*, 1a, b, ♂, 1c, d, ♀).

*Abisara prunosa*, Moore, Proc. Zool. Soc. Lond. 1879, p. 137; *id.* Lep. of Ceylon, i. p. 69, pl. 33, fig. 3, 3a, ♂ ♀, 3b, *larva* and *pupa* (1881). de Nicéville, Butt. of India, etc., ii. p. 325 (1886).  
*Abisara fraterna*, Moore, Proc. Zool. Soc. Lond. 1883, p. 532. de Nicéville, Butt. of India, etc., ii. p. 325 (1886).

IMAGO.—Male. Upperside very rich deep purple-brown, with slightly paler transverse discal fasciæ and marginal line. *Hindwing* also with two large subapical and two smaller subanal conical black spots edged outwardly by a delicate white line; and two intervening pale-bordered dark brown conical spots. Underside paler and duller purple-brown, the transverse fasciæ and marginal line being distinct and of a dull pale purplish-grey; submarginal line, and outer edge of prominent black spots on the hindwing, white.

Female. Upperside much duller, and of a dark ochreous-brown, the discal fasciæ and marginal line distinct and more or less of a pale brown or sullied white; conical spots on the hindwing prominent. Underside paler brown; the discal fasciæ prominent and of a sullied brownish-white or purpurescent-white; marginal line white; three subapical and two subanal conical black spots on hindwing, with white outer edges.

Expanse, ♂  $1\frac{6}{10}$  to 2, ♀  $1\frac{8}{10}$  to 2 inches.

*Dry-season brood* (Plate 402, figs. 1e, f, ♂, 1g, h, ♀).

*Abisara suffusa*, Moore, Proc. Zool. Soc. Lond. 1882, p. 244. de Nicéville, Butt. of India, etc., ii. p. 325 (1886).

Male. Upperside dull brown, of various shades, the angled-edge of discal fascia darkest, the fasciæ paler and diffused; the black spots on hindwing much smaller. Underside paler; markings more or less similar to the wet form.

Female. Upperside ochreous-brown, the outer borders palest; the fasciæ much diffused, the discal being well-defined by a darker angled inner edge; black spots on the hindwing very small, but distinct. Underside. Ground-colour as on the upperside, but paler; markings similar, but with the fasciæ paler.

Expanse, ♂  $1\frac{6}{10}$ , ♀  $1\frac{6}{10}$  to  $1\frac{8}{10}$  inch.

LARVA.—“Flat, very broad in the middle, tapering to both ends; clothed sparsely with short hairs; head small, not enclosed in the second segment. Colour light green.”

PUPA.—“So like the larva that it is difficult to note exactly when the change takes place; it is also clothed with hairs. It is closely attached to a leaf by the tail and a girdle” (J. Davidson and E. H. Aitken, Journ. Bombay N. H. S. 1890, 352).

HABITAT.—Lower Himalayas; Eastern, Central, and South India; Ceylon.

INTERMEDIATE VARIETIES.—This is a very variable species, both on the upperside and underside, especially in the *dry-season* males. In some males (from Ceylon, Anamully Hills, Western India, Travancore) the upperside is of the same rich purple-brown of an ordinary *wet-season* specimen, but on the underside, the coloration and markings are of a normal *dry-season* male. Other males (from Wangui, Thanah, Bombay, and Poona) are dull purple-brown on the upperside, but with ordinary coloration and markings, though much less prominent, of normal *wet-season* specimens. A male of the *dry form* from Ranchi, Chota Nagpur, is of a much duller purple-brown on the upperside, but on the underside, it has the coloration and prominent markings of a normal *wet form*. Other males, of smaller expanse, from Poona, Bombay, and Sikkim, have both the upper and underside, of either an olivescient ochreous-brown, or purpurescent-brown, with characteristic *dry-season* markings. Again, in some Ceylon specimens, both of male and female, of the *dry-season* form, the upperside is of a normal *dry form*, but with the coloration and prominent markings of the *wet form*.

HABITS OF IMAGO.—Mr. E. H. Aitken writes, “I have found it in Poona, but rarely, if ever, in Bombay, though it is common in the low jungles of the Tanna District. When the rainy season is drawing to a close in September or October, every bush on the Hills is enlivened by the attitudes and frolics of this little embodiment of vanity. In all its ways it is unique, perching in the middle of a leaf, on the upperside, with wings half open, turning jerkily from one side to another, then hopping to another leaf and strutting round it. Sometimes a pair join in these performances. It is one of the easiest butterflies to catch, having no fear” (Journ. Bombay N. H. S. 1886, 215). “It is very common at all seasons, perching on leaves with its wings partly open, and facing about every now and then in a way peculiar

to itself. They fly much at dusk very swiftly, chasing each other in the air" (J. Davidson, *id.* 1896, 258).

FOOD-PLANT AND HABITS OF LARVA.—“ We found the larva very abundant in July, 1889, and occasionally till the end of the rains, on *Embelia robusta*, Order Myrsinæ. The larva rests on the underside of the leaf, which is of the same tint of green as itself” (*id.* l.c. 1890, 352). Mr. L. de Nicéville says the “larva also feeds on *Ardisia humilis*, Myrsinæ” (J. A. S. Beng. 1900, 234).

DISTRIBUTION.—We possess specimens of both sexes of the *wet* (*prunosa* type) and *dry* forms of this species from Ceylon; Travancore, the dry form taken in February; Kanara, Nilgiris; Poona; Belgaum; Matheran (*fraterna* type); Wangui, Thannah District, Bombay; Alibagh, dry form taken in January; Calcutta; Deyra Dhoon, N.-W. India. We have also verified specimens in the British Museum, as follows:—*Wet* form from Nepal; Nilgiris (August); Ceylon (July). *Dry* form, Nilgiris, 3500 (Hampson); Mysore, November and January (Watson); Belgaum, April (Dudgeon); Ganjam, February (Watson); Durbunga; Chumba (type of *suffusa*), 10,000 feet, Western Himalaya, taken by Rev. J. Hocking. Col. Swinhoe has the *wet* form, taken in Kanara, in July, and at Khandalla in October; also the *dry* form from Poona (March), Mahableshtar (April); Maldah, Orissa (March), and Sikkim. Mr. H. Grose-Smith has the *wet* form from Naini Tal, Kumaon; Ranchi, Chota Nagpur, and Sikkim. Mr. F. Godman has the *wet* form from Masuri, W. Himalaya, and the *dry* form from Simla, and the Anamully Hills, S. India (Davidson).

In Ceylon, this species is “common in the Western and Central Provinces, in forest land, nearly all the year. It has a rapid darting flight and settles on the underside of leaves with open wings. Plentiful amongst the undergrowth of open jungle, or by road sides. It is found in low country and up to 4000 feet” (Lep. Ceyl. i. 69). Mr. L. de Nicéville says “it is common in Ceylon in the low country in June and July, and again in November and December” (J. A. S. Beng. 1899, 196). Mr. H. S. Ferguson records it (*prunosa*) as being found “common in the Travancore Hills at the sides of roads in jungle, also in the low country, the specimens varying a good deal” (J. Bombay N. H. S. 1891, 10). Capt. E. Y. Watson took it at Kathlekan, Mysore, in December, January and February, and at Gersoppa Falls in January” (*id.* 1890, 5). Col. C. Swinhoe records it (*fraterna*) from “Poona, September; Khandalla, November” (P. Z. S. 1885, 130). Capt. Chaumette found it “very common at Saugor in October and November, skipping about the garden at twilight” (Ent. Mo. Mag. 1865, 38). Capt. A. M. Lang took it at “Umballa in August” (*id.* 1864, 183). Mr. W. Doherty obtained it at Ranibagh, 1000 feet, Kumaon, also at Askot and in the Kali Valley, 2000 to 5000 feet” (J. As. Soc. Beng. 1886, 134). Mr. J. Rothney records it as “not a common

insect at Barrackpur, near Calcutta, from May to October" (Ent. Mo. Mag. 1882). Mr. L. de Nicéville found it "common in Calcutta at all times except in the three coldest months. It has a very quick flight, but settles often on the upper side of a leaf in the shade, with half-expanded wings" (J. As. Soc. Beng. 1885, 45). Mr. de Nicéville also records it (as *suffusa*) from Barrackpur (Rothney), the Kangra Valley (Hocking), Masuri, Fyzabad, Malda, Calcutta, Bhotan, Orissa, Karwar, and Rutnagherry, Bombay; Nilgiris; and (as *fraterna*) from Karinga; Bombay" (Butt. Ind. ii. 325).

Of our illustrations on Plate 402, fig. 1 represents the larva and pupa, 1a, b, male, and 1c, d, female, *wet-season* form from Ceylon; fig. 1e, a *dry-season* male from Ranchi, Chota Nagpur, 1f, a *dry-season* male from Poona, and 1g, h, a *dry-season* female from Ceylon.

**ABISARA BIFASCIATA** (Plate 403, figs. 1, 1a, ♂, 1b, c, ♀).

*Abisara bifasciata*, Moore, Proc. Zool. Soc. Lond. 1877, p. 587, pl. 58, fig. 1, ♀. Wood-Mason and de Nicéville, Journ. As. Soc. Beng. 1881, pp. 233, 248. de Nicéville, Butt. of India, etc., ii. p. 323, pl. 24, fig. 118, ♂ (1886).

IMAGO.—Male. Upperside dark purple-brown. *Forewing* with distinctly-defined discal paler almost purplish-grey fasciæ, which are palest anteriorly. *Hindwing* with similar pale-bordered large conical spots, the two subapical and two subanal being black and outwardly white-edged. Underside dark purplish-red, paler basally; the discal fasciæ broad and sinuous, prominent, and dull purplish-grey; the two subapical and two subanal black spots very prominent, large, and sharply white-edged exteriorly.

Female. Upperside dark purplish-red. *Forewing* with the two discal fasciæ sinuous, prominent, and broadly white anteriorly, the inner fascia broadest, the lower portions being purplish-white; submarginal and marginal line also prominent. *Hindwing* with prominent discal purpurescent-white sinuous fascia, marginal line, borders of the outer conical spots, and marginal line; the two large subapical (and sometimes also a minute upper one), and the two subanal conical black spots very prominent and externally white-edged. Underside dark purplish-red, paler basally; all the markings on both wings, as on upperside, very prominently whiter; the black spots on hindwing much more prominent.

Expanse, ♂  $1\frac{8}{10}$  to 2, ♀ 2 to  $2\frac{2}{10}$  inches.

HABITAT.—South Andamans; ? Nicobars.

DISTRIBUTION.—Numerous specimens were collected at Port Blair, S. Andamans, by the late F. de Roëpstorff. A single male, recorded from Kar Nicobar, is in the Indian Museum, Calcutta.

## ABISARA ABNORMIS.

*Abisara abnormis*, Moore, Proc. Zool. Soc. Lond. 1883, p. 532, pl. 49, fig. 3, ♂. de Nicéville, Butt. of India, etc., ii. p. 324 (1886).

*Wet-season brood* (Plate 403, figs. 2, 2a, ♂, 2b, c, ♀).

IMAGO.—Male. Upperside dark purplish-brown or plum-colour. *Forewing* with a medial-discal narrow angular, dark inner-bordered, pale lunular fascia, the upper portion of which, above the median veinlet, is macular, and more or less distinctly whitish; followed by an outer-discal pale lunular fascia and a submarginal slender lunular line; the discocellular streak at end of cell blackish. *Hindwing* with a much less-defined medial-discal angular fascia; followed by a submarginal row of pale-edged dark conical spots, the apical and subanal pair being black. Underside paler; the veins outwardly paler lined. *Forewing* with the medial-discal angular fascia very prominent and entirely violaceous-white, the submarginal and marginal line slender. *Hindwing* with the medial-discal angular lunular fascia very prominent and entirely violaceous-white; the submarginal row of white-edged conical spots also prominent, the three upper and two lower black.

Female. Upperside somewhat paler. *Forewing* with the medial-discal angular fascia somewhat broader and more distinct throughout its length, the two outer as in the male. *Hindwing* marked as in the male, but more distinctly. Underside paler; with markings as in the male.

Expanse, ♂  $1\frac{6}{10}$ , ♀  $1\frac{8}{10}$  inch.

*Dry-season brood* (Plate 403, figs. 2d, e, ♂, 2f, ♀).

Male. Upperside paler than in wet-season brood, the female browner. *Forewing* with the angular medial-discal and submarginal fascia, and the marginal line, obsolescently diffused or slightly defined by a paler tint than the ground-colour, the dark angular discal bordering line being prominent in the female. *Hindwing* with similar, but somewhat obsolescent markings, as in the wet-season male. Underside. Both wings with markings as in the wet-season form, but less prominent; the discal angular violet-white fascia being narrower.

Expanse, ♂ ♀  $1\frac{6}{10}$  to  $1\frac{8}{10}$  inch.

HABITAT.—Lower Burma.

DISTRIBUTION.—We possess both sexes of the *wet*-season form from Moulmein, Rangoon, Salween Valley, taken in August, and from Thoungyeen Valley, Upper Tenasserim, and of the *dry* form from Lower Burma. Col. C. H. E. Adamson has a *dry*-season male from Akyab, taken in October. Col. C. Swinhoe has a *wet* male and female from Rangoon, taken in July and October. Mr. H. Grose-Smith has both forms from Toungoo.

S.E. CHINA AND MALAY SPECIES.—*Abisara Echerius*—Wet-season form,—(Pap. Echerius, Stoll, Cram. Pap. v. pl. 31, figs. 1, 1a, b, c (1790). Butler, Catal. Fabr. Lep. B. M. p. 137 (1869). Walker, Trans. Ent. Soc. 1895, p. 459. *Syn.* Pap. Odin, Fabr. Ent. Syst. iii. p. 56 (1793). Pap. Coriolanus, Fabr. *id.* p. 284. Lyc. Xenodice, Hübn. Verz. bek. Schmett. p. 23 (1816).—Dry-season form,—(Sospita Lydda, Hewitson, Exot. Butt. iii. *Sos.* pl. fig. 13, ♀ (1866). Sospita saturata, Moore, Proc. Zool. Soc. 1878, p. 701, ♂ ♀. *Habitat.* S.E. China; Macao, Hong Kong. A male of the *wet*-season form, from Macao, and a male from Hong Kong agreeing with Stoll's figures, and males and females of the *dry*-season form, also from Hong Kong, are in the British Museum.—*Abisara Palawanica*, Staudinger, Deuts. Ent. Zeit. 1889, p. 90. *Habitat.* Palawan.—*Abisara Kausambioides*, de Nicéville, Journ. As. Soc. Beng. 1895, p. 442, ♂. *Syn.* A. Kausambi, Distant, Rhop. Malay. pl. 18, fig. 10, ♂. *Habitat.* Malay Peninsula; Sumatra; Nias; Borneo.

GENUS POLYCÆNA, Staudinger, Stett. Ent. Zeit. 1886, p. 227; *id.* Exot. Schmett. p. 233 (1892). Leech, Butt. of China, i. p. 293 (1893).—*Polycæna princeps* (Emesis princeps, Oberthür, Etud. Entom. xi. p. 22, pl. 7, fig. 57 (1836). Leech, *l.c.* p. 293. *Habitat.* W. China.—*Polycæna Lama*, Leech, *l.c.* p. 294, pl. 28, fig. 13, ♂, 15, ♀ (1893). *Habitat.* E. Tibet; W. China.—*Polycæna matuta*, Leech, *l.c.* p. 294, pl. 28, fig. 16, ♂ (1893). *Habitat.* W. China.

#### Genus TAXILA.

*Taxila*, Doubleday, List Lep. Brit. Mus. pt. 2, p. 2 (1847). Westwood, Gen. D. Lep. ii. p. 421 (1851). Hewitson, Exot. Butt. ii. p. 91 (1861). Bates, Journ. Linn. Soc. Lond. ix. p. 414 (1867). de Nicéville, Butt. of India, etc., ii. p. 316 (1886). Staudinger and Schätz, Exot. Schmett. ii. p. 232 (1892).

*Abisara* (part), Distant, Rhop. Malayana, p. 188 (1883).

IMAGO.—Male. *Forewing* subtriangular; costa much arched, apex pointed, exterior margin very slightly oblique, even, posterior angle rounded; costal vein extending to middle of the margin; first and second subcostal branches emitted before end of the cell, both short, third at one-third beyond the cell, fourth at half beyond and ending at the apex, fifth ending below the apex; cell rather short, very broad; upper discocellular obsolete, two lower concave, long; upper radial in a line with the subcostal, lower radial from slight angle in middle of discocellulars; middle median branch emitted at some distance before lower end of the cell; submedian recurved. *Hindwing* short, broadly ovate; costal margin abruptly lobed at the base, thence straight, apex rounded, exterior margin and anal angle very convex and very slightly uneven, but scalloped and slightly angular at end of upper median vein in the female; precostal vein short, pointed, emitted from angle of the costal; the costal vein bent outward at some distance above its base, and then extending to

about middle of the margin; subcostal similarly bent upward and thus making the base of the cell broad; discocellulars oblique and long, upper shortest and straight, lower slightly concave; subcostal branch emitted at some considerable distance beyond the cell; middle median branch at a short distance before lower end of the cell, lower median at fully half distance and opposite base of upper discocellular. *Body* robust; thorax stout; head broad, with a compact truncated tuft; eyes naked; antennæ moderately long and slender, club well-formed, tip pointed; palpi very short, slender, first and second joints finely and smoothly scaled at the sides and laxly scaled beneath, third joint minute; *forelegs of male* small, very densely clothed with fine soft hairs; *forelegs of female* longer, slender, scaly, tarsus well articulated, armed beneath with lateral spines, terminal joint small, oval, armed at the tip with two regularly-formed much curved acute claws, paronychia and pulvillus.

TYPE.—T. Haquinus (*Drupadi*, Horsf.).

**TAXILA FASCIATA** (Plate 404, figs. 1, 1a, ♂, 1b, c, ♀).

*Taxila fasciata*, Moore, Proc. Zool. Soc. Lond. 1878, p. 832, pl. 52, fig. 1, ♂. de Nicéville, Butt. of India, etc., ii. p. 318 (1886). Grose-Smith, Rhop. Exot. *Dir.* pl. figs. 6, 7, ♀ (1901).

IMAGO.—Male. Upperside. Dark rich ochreous-brown. *Forewing* with the apical area very slightly suffused with ochreous-red and traversed by an oblique subapical short obscure greyish fascia. Underside bright red. *Forewing* with the base of costa to below the subcostal, and also the posterior border, pale ochreous; a well-defined bluish-grey oblique bar within the cell, an angled bar beyond the cell, a short streak above the latter and broken by the subcostal, a short streak in the base of upper and lower median interspace, and a less-defined inner spot in base of the submedian interspace, followed by an outer-discal transverse series of small spots, the lower four of which are dentate, the upper ones—disposed obliquely-inward to the costa—are larger, broader, confluent, and violet-white, these latter thus forming a short subapical oblique macular fascia; beyond is a submarginal slender interrupted line, becoming obsolescent apically; the cell and discal marks are each black-bordered, the outer-discal series being black-bordered only on their inner edge, and the submarginal line on its outer edge. *Hindwing* with a pale ochreous subbasal streak; a black-bordered bluish-grey bar across middle of the cell, a medial-discal irregular series of similar bars, and a less prominent outer-discal row of paler dentate marks with a contiguous inner series of blackish dentate marks; followed by a prominent submarginal whitish interrupted line edged outwardly by a black line.

Female. Upperside dusky ochreous-red. *Forewing* with a more or less ill-defined

blackish inner-bordered dull grey bar beyond the cell, two similar discal spots placed in the median interspaces, a curved outer-discal series bordered outwardly from the upper median branch by an oblique subapical broad white fascia; followed by a submarginal interrupted whitish line. *Hindwing* with an ill-defined discal series of blackish inner-bordered dull grey spots, an outer-discal row, and then a submarginal interrupted whitish line. Underside paler red than in the male; with similar markings, except that the forewing has the broad subapical white fascia as on the upperside.

Expanse, ♂  $1\frac{8}{10}$  to 2, ♀ 2 to  $2\frac{1}{10}$  inches.

HABITAT.—Burma; Upper and Lower Tenasserim.

DISTRIBUTION.—The type specimens were taken at Ahsown, Upper Tenasserim. "There is a male in the Indian Museum, Calcutta, obtained by Dr. J. Anderson in the Mergui Archipelago in December; both sexes from Tavoy. Major Marshall has a male taken in the Thoungyeen forests in February and May, and one in the Donat Range, all by Captain C. T. Bingham" (Butt. Ind. ii. 318). Mr. W. Doherty obtained it in East Pegu in March and April (P. Z. S. 1891, 287). Col. C. H. E. Adamson records it "as common in Northern Burma in April, May and June" (List, 1897, 28). A male from Hounghdraw, Tenasserim, taken in November, and a female from the Karen Hills, taken in December, are in the British Museum. We possess a male from the Thoungyeen Valley, taken in January by Captain Bingham. Both sexes, from the Ataran Valley, Middle Tenasserim, taken by Mr. T. A. Hauxwell, are in Mr. H. Grose-Smith's collection.

**TAXILA THUISTO** (Plate 404, figs. 3, 3a, ♂, 3b, c, ♀).

*Taxila Thuisto*, Hewitson, Exotic Butt. ii. *Tac.* pl. 1, figs. 5, 6, ♀ (1861). Druce, Proc. Zool. Soc. Lond. 1873, p. 347. de Nicéville, Butt. of India, etc., ii. p. 317 (1886).

*Abisara Thuisto*, Butler, Annals of Nat. Hist. 1870, p. 362. Distant, Rhop. Malayana, p. 191, *woodcut*, ♂ ♀ (1883).

IMAGO.—Male. Upperside. Both wings uniformly very dark indigo-blue or black; cilia black. In some specimens the subapical pale spots of the underside of the forewing show faintly through the deep black ground-colour. Underside. Deep bright-red. *Forewing* with the apex paler red; base of the costa, and the posterior border below the median vein greyish-brown; a glossy cobalt-blue slender straight oblique longitudinal streak extending within the cell below the subcostal, an inner-discal recurved streak which commences at the base of first subcostal interspace, passing outside the middle discocellular veinlet, thence across lower end of the cell to base of the lower median interspace; a medial-discal transverse row of six small spots of which the one between the upper and lower radials is the largest, and rounded; followed by an outer-discal row of six somewhat larger spots of which the three upper are



largest and somewhat elongated, the upper one being slender; beyond is a submarginal row of three linear lower streaks and three upper small spots; all these markings are black-bordered in their interspaces between the veins. *Hindwing* with the outer border somewhat greyish-brown; crossed by a black-bordered cobalt-blue subbasal oblique streak, an inner-discal series of spots, a medial-discal and an outer-discal series of lunules, followed by a submarginal row of linear spots.

Female. Upperside dusky rufous. *Forewing* with a black slender discocellular bar, an inner-discal transverse row of black spots, a medial-discal curved row of black-bordered bluish-white spots, of which the five upper are largest and the three lower are dentate or sometimes obsolescent, followed by a submarginal row of black-bordered linear spots. *Hindwing* with an inner-discal row of blackish spots, an outer-discal curved row of bluish-white lunules which are inwardly broadly and outwardly narrowly black-bordered, followed by a submarginal row of black-bordered bluish-white linear streaks. Underside paler rufous; with black-bordered but paler glossy-blue markings, similar to those in the male, except that on the forewing the outer-discal row of spots are large and white, as on the upperside.

Expanse, ♂  $1\frac{7}{10}$ , ♀  $1\frac{8}{10}$  inch.

HABITAT.—Burma; Tenasserim; Malay Peninsula; Singapore; Sumatra; Borneo.

DISTRIBUTION.—Col. C. H. E. Adamson has a female taken in the upper Ataran Valley in October, and records "three females caught on the Salween River, above Moulmein, in July and August, and one at Natchoung, Upper Tenasserim, in October" (List, 1897, 28). A male and female, labelled "Naga Hills," and a male from Moulmein are in Mr. P. Crowley's collection. "A single male is recorded, from Tavoy, which has the silvery spot of the submarginal series in the subcostal interspace on the underside of the forewing, showing through on the upperside" (J. A. S. Beng, 1887, 427). Dr. J. Anderson obtained it in "Mergui, March, and on Kisseraing Island in January" (J. Linn. Soc. Zool. 1886, 38). A male from the Ataran Valley, Tenasserim, taken in January by Col. C. T. Bingham, one from Donat Range taken in November, and both sexes from the Karen Hills taken in December, are in the British Museum.

It also occurs in the Malay Peninsula, Sumatra, and Borneo.

**TAXILA BURNII** (Plate 404, figs. 2, 2a, ♀).

*Taxila Burnii*, de Nicéville, Journ. Bombay Nat. Hist. Soc. 1895, p. 266, pl. N, figs. 9, ♀.

IMAGO.—"Female. Upperside. Both wings light ferruginous, with all the markings of the underside showing through more or less by transparency. *Forewing* with the outer-discal or submarginal series of diffused or irrorated rounded whitish

spots arranged in a slightly outwardly-curved line across the wing, from the costa to the first median nervule, more prominent anteriorly, obsolete posteriorly; a similar marginal linear series, each spot on both sides outwardly defined with black. *Hindwing* with the marginal series of spots as in the forewing, but the two anteriormost spots divided by the discoidal nervule larger than the others. Underside. Both wings a little paler than above, rather more ochreous in shade. *Forewing* with the inner margin as far as the submedian nervule whitish; the discocellular nervules narrowly defined by a dark ferruginous line; an inner-discal macular white fascia, the anterior portion of which from the costa to the third median nervule is formed of spots divided only by the crossing veins and arranged in one straight line, followed by three spots placed in echelon in the median and submedian interspaces, these three spots forming an inwardly-oblique straight line; an outer-discal curved series of white spots arranged regularly across the wing from the third subcostal nervule to the submedian nervule; a marginal, narrow, almost continuous, series of white spots, prominently defined on both sides by a fine black line. *Hindwing* with an inner-discal series of white spots very similar to that on the forewing, but the anterior portion ending on the third median nervule is wider; followed by an indistinct castaneous macular fascia, which is continued somewhat indistinctly on to the disc of the forewing; two marginal apical large rounded black spots divided by the discoidal nervule, each spot bears outwardly a large white area, inwardly each spot bears a few white scales; in the median, submedian, and internal interspaces are large conical outline silvery-white spots, the base of the cone is on the margin, the apex is towards the base of the wing, the spot in the internal interspace the smallest and oval in shape. Cilia of both wings dusky, just touched inwardly with whitish; antennæ above black, beneath prominently annulated with white, the base of club also white; thorax and abdomen above concolorous with the wings, beneath white; legs with the femur white, the tibia and tarsus ochreous."

Expanse, ♀  $1\frac{9}{10}$  inch.

HABITAT.—Upper Burma.

We have not seen any example of this butterfly, which, according to Mr. de Nicéville, "is a very aberrant species, and seems to form a link, as far as the markings go, between the known species of the genus *Taxila* and the typical group of the genus *Abisara* (A. Echerius)."

DISTRIBUTION.—The type specimen, a female, was "taken in April at Loi Maw, 5000 feet elevation, in the Kachin Hills, Upper Burma, by Lieut. J. N. Burn, R.E." (de Nicéville *l.c.*).

INDO-MALAY SPECIES.—*Taxila Haquinus* (Pap. Haquinus, Fabricius, Ent. Syst. iii. i. p. 55 (1793). *Abisara Haquinus*, Butler, Catal. Fabr. Lep. Brit. Mus. p. 137 (1869). Distant, Rhop. Malay. p. 190, pl. 18, fig. 13, ♀ (1883). *Syn. Emesis*

Drupadi, Horsfield, Catal. Lep. Mus. E. I. C. pl. 2, figs. 3, 3a, ♂ ♀ (1828). Boisd. Spéc. Gén. Lép. i. pl. 7, fig. 2, ♂ (1836). *Habitat.* Malay Peninsula; Singapore; Java; Borneo.—*Tavila Zemara* (Abisara Zemara, Butler, Ann. Nat. Hist. 1870, p. 363. *Habitat.* Sarawak; Labuan; Borneo.—*Tavila Palawanicus*, Staudinger, Iris, Deuts. Ent. Zeit. 1889, p. 91. *Habitat.* Palawan.

Genus LAXITA, Butler, Trans. Linn. Soc. Zool. 1879, p. 546. Abisara (part), Distant, Rhop. Malay. p. 188 (1883).—*Laxita Tanita* (T. Tanita, Hewits. Exot. Butt. ii. *Tax.* pl. 1, text (1861). Butler, *l.c.* p. 546. Distant, Rhop. Malay. p. 192, pl. 18, fig. 14, ♀ (1883). T. Orphna, Doubleday and Westw. Gen. D. Lep. ii. p. 422, pl. 69, figs. 6, 7, ♂ ♀ (1851). *Habitat.* Malay Peninsula.—*Laxita Orphna* (E. Orphna, Boisd. Spéc. Gén. Lép. i. pl. 21, fig. 4 (1836). Hewits. Exot. Butt. ii. *Tax.* pl. 1, fig. 7 (1861). *Habitat.* Borneo.—*Laxita Damajanti* (Ab. Damajanti, Felder, Wien. Ent. Monat. iv. p. 397 (1860). Distant, *l.c.* p. 192. T. Tanita, Staudinger, Exot. Schmett. i. pl. 87. *Habitat.* Malay Peninsula; Sumatra.—*Laxita Telesia* (T. Telesia, Hewits. *l.c.* ii. *Tax.* pl. 1, figs. 1, 2 (1861). *Habitat.* Borneo.—*Laxita Lyclene*, de Nicéville, Journ. As. Soc. Beng. 1894, p. 21, pl. 2, fig. 10, ♂. *Syn.* A. Telesia, Distant, *l.c.* p. 449, pl. 40, figs. 2, 3, ♂ ♀. Staudinger, *l.c.* i. pl. 87, ♂. *Habitat.* Malay Peninsula; Sumatra.—*Laxita Laocoon*, de Nicéville, *l.c.* 1894, p. 19, pl. 2, fig. 6, ♀. *Habitat.* Malay Peninsula.—*Laxita Lola*, de Nicéville, *l.c.* p. 20, pl. 2, figs. 7, 9, ♂ ♀. *Habitat.* S.E. Borneo.—*Laxita Lyncestis*, de Nicéville, *l.c.* p. 21, pl. 2, fig. 8, ♂. *Habitat.* Malay Peninsula.—*Laxita Teneta* (T. Teneta, Hewits. Exot. Butt. ii. *Tax.* pl. 1, figs. 3, 4 (1861). *Habitat.* Sarawak; Borneo.—*Laxita Hewitsoni* (T. Hewitsoni, Rober, Ent. Nachr. 1895, p. 150. *Habitat.* Borneo.

### Genus ZEMEROS.

*Zemerus*, Boisduval, Spéc. Gén. Lép. i. pl. 21, fig. 5 (1836). Westwood, Gen. D. Lep. ii. p. 418 (1851). Distant, Rhop. Malay. p. 187 (1883). de Nicéville, Butt. of India, etc., ii. p. 307 (1886). Staudinger & Schätz, Exot. Schmett. ii. p. 231 (1892). Leech, Butt. of China, i. p. 289 (1893). *Hamanumida* (part), Hübn. Verz. bek. Schmett. p. 18 (1816).

IMAGO.—Wings short, broad. *Forewing* triangular; costal margin arched very slightly towards the end, apex slightly acute; outer margin oblique, irregularly scalloped, and slightly convex, but most so in the female; posterior margin short; costal vein reaching middle of the margin and bent upward near its end; first and second subcostal branches emitted near together a little before end of the cell, third branch at about two-fifths beyond, fourth at three-fifths and ending before the apex; cell not extending to quite half the wing; upper discocellular obsolete, middle and lower discocellulars of about equal length, slender, each slightly concave; upper radial emitted in a line with the subcostal, lower radial from angle of discocellulars;

middle median emitted from immediately before lower end of the cell. *Hindwing* very short, broad, irregularly-oval or somewhat quadrate; anterior margin abruptly lobate at the base; exterior margin irregularly scalloped and somewhat angularly produced at end of upper median veinlet; anal angle obtusely pointed; cell very short and broad; precostal vein rather long, curved outward, emitted opposite juncture of the subcostal; first subcostal branch starting from above or at a little beyond end of the cell; discocellulars somewhat oblique, each slightly concave, of equal length; two upper median veinlets emitted from lower end of the cell; lower median at one-third before end of the cell. Body small; thorax moderately stout; frontal tuft dense; eyes naked; palpi very small, not visible from above, flattened laterally, almost horizontal, rather thickly clothed beneath with short hairs, apical joint not visible; antennæ slender, club rather short, tip obtuse; *forelegs of male* very small, densely clothed with hairs; *forelegs of female* long, slender, well clothed with scales, tarsal joints concealed, terminal joint with two small delicate, very slender claws, short paronychialia, and pulvillus.

TYPE.—Z. Flegyas [Allica].

#### ZEMEROS FLEGYAS.

*Wet-season brood* (Plate 405, figs. 1, 1a, b, c, ♂ ♀).

*Papilio Flegyas*, Cramer, Pap. Exot. iii. pl. 280, fig. E, F, ♂ (1780).

*Zemerus Flegyas*, Doubleday, List Lep. Brit. Mus. pt. 2, p. 1 (1847). Westwood, Gen. D. Lep. ii. p. 419, pl. 69, fig. 5, ♂ (1851). Moore, Catal. Lep. Mus. E. I. Company, i. p. 242 (1857). Butler, Catal. Fabr. Lep. Brit. Mus. p. 136 (1869). de Nicéville, Butt. of India, etc., ii. p. 308, pl. 24, fig. 115, ♂ (1886). Staudinger, Exot. Schmett. i. p. 238, pl. 87 (1888). Leech, Butt. of China, i. p. 296 (1893).

*Zemerus Phlegyas*, Doherty, Journ. As. Soc. Bengal, 1886, p. 134.

*Papilio Allica*, Fabricius, Mant. Ins. ii. p. 52 (1787); Ent. Syst. iii. i. p. 244, ♀ (1793). Donovan, Ins. of India, pl. 37, fig. 2, ♀ (1800).

*Hamanumida Allica*, Hübner, Verz. bek. Schmett. p. 18 (1816).

*Erycina Allica*, Godart, Encyc. Méth. ix. p. 566 (1823).

*Zemerus indicus*, Fühstorfer, Berl. Ent. Zeit. 1897, p. 333.

IMAGO.—Male. Upperside rich dark brownish ochreous-red. Cilia black alternated with white. Both wings crossed by four series of small white spots which are longitudinally bordered between the veins by black streaks, as follows:—*Forewing* with a short narrow bar across middle of the cell and a longer bar below it in the submedian interspace; an inner-discal row of somewhat triangular spots, of which series the one in the upper median interspace is out of line and much nearer the outer margin; an outer-discal row of smaller spots, of which the two upper only are distinct, the lower being lunular and more or less slightly defined or

obsolescent; followed by a submarginal row of distinct short lunular spots. *Hind-wing* with a narrow bar across middle of the cell, and one, or two very small spots generally present below it in the submedian and internal interspaces; an inner-discal curved series of somewhat triangular spots, the one in the upper median interspace being outwardly placed; an outer-discal row of slightly-defined lunate spots; followed by a submarginal row of distinct short lunular spots. Underside paler; all the white spots, as on upperside, more prominent, and with the longitudinal bordering black streaks much reduced.

*Female.* Upperside slightly paler; all the white markings the same, but slightly more prominent. Underside as in the male; all the white markings more distinct.

Expanse, ♂  $1\frac{5}{10}$  to  $1\frac{7}{10}$ , ♀  $1\frac{7}{10}$  to  $1\frac{8}{10}$  inch.

*Dry-season brood* (Plate 405, figs. 1, d, e, f, g, ♂ ♀).

*Zemerus Confucius*, Moore, Proc. Zool. Soc. Lond. 1878, p. 701.

*Male.* Upperside dark vinaceous-brown. Both wings with less-defined whitish, or obscure sullied brownish-white spots, and with much less apparent intervening longitudinal blackish borders, which latter are generally more or less obsolescent or in some quite obsolete; on the *forewing* the outer-discal spots are represented by two upper whitish spots somewhat larger than in the wet form, or by three, and sometimes four upper still larger but more sullied spots, the lower spots of this series being more or less diffused and obscure, or obsolete; on the *hindwing* the outer-discal series is also more or less diffused and obsolescent or obsolete; the submarginal spots being very small. Underside darker reddish-brown or browner than in wet form; the white spots with black border either more or less prominent as in the wet form, or the basal and outer series are smaller and obscure; the outer-discal series, as described on the upperside, the two or three anterior spots being prominently white and larger than on the upperside.

*Female.* Upperside paler and brighter brownish ochreous-red than in wet form; the sullied white spots as in male, the outer-discal series on the *forewing* being also composed of two upper spots, sometimes three, or four, and the lower more broadly diffused and obscure; the outer-discal series on the *hindwing* also being broadly diffused. Underside paler than in wet form; with the markings as in male.

Expanse, ♂  $1\frac{4}{10}$  to  $1\frac{6}{10}$ , ♀  $1\frac{5}{10}$  to  $1\frac{6}{10}$  inch.

*LARVA.*—“Adult. Length .75 of an inch. Ovate, extremely flattened, inconspicuous. Colour pale green, head and anal segment slightly lighter; all the segments laterally rounded, covered with a whitish down, especially at the sides; an indistinct double longitudinal dorsal darker-green line throughout, enclosing a

minute orange spot on the seventh and eleventh segments; middle segments more than twice as broad as they are long; legs pale green, set well beneath the animal, and rather close together. Full grown at the end of March. Feeds on *Mæsa Montana*. The larva when about to change into the pupal state, attaches itself to a patch of silky-web, by the last segment, to the underside of a leaf of the food-plant, with the head towards the apex, and is girt about the middle with another web."

PUPA.—"Length .55 to .70 of an inch. Fusiform, broadest in the middle, tapering towards both ends, with the anterior end truncate-rounded, distinctly broader than the posterior; the whole pupa flattened, and of very slight depth even in the thickest part; the divisions between the segments well-marked; posterior segment bluntly rounded; head also rounded and divided in the middle at the apex into two lobes by a shallow notch, the sides of which are parallel to one another and at right angles to the bottom; colour bright yellowish-green throughout, marked above with rich emerald-green narrow lines arranged in an arabesque-like pattern on the two outer-thirds; a series of round spots along middle of the back on the abdomen only, and a subdorsal line on either side interrupted at the segmental constrictions. Under surface pale yellowish-green throughout, entirely unmarked. Owing to the extremely depressed form of the pupa, the wing-cases are almost entirely invisible from above, they show only by a very narrow emerald-green line on each side of the thorax and two anterior abdominal segments. The whole surface of the pupa is entirely smooth, without any hairs or shagreening whatever" (G. C. Dudgeon, Proc. As. Soc. Bengal, 1890, 138).

HABITAT.—W. and E. Himalayas; Assam; Silhet; Cachar; Burma; Tenasserim; ? Malay Peninsula; Penang; Siam; W. and C. China; Hong Kong; Hainan.

DISTRIBUTION.—We have examined, and verified, specimens of the *wet-season* form from Nepal, Sikkim, Bhotan, Assam, Khasia Hills, Chittagong—taken in November, Bhamo, Mandalay, Rangoon—taken in July, Siam (type of *Allica*), W. and C. China; and of the *dry-season* form from Masuri, Sikkim—taken in March, and Bhotan in April and May—by Mr. G. C. Dudgeon, Khasia Hills, Toungoo, Moulmein, Thoungyeen—taken in February, East Pegu—taken in March and April by Mr. Doherty, Beeling, Tenasserim—taken in March and April by Capt. Watson, Mergui Archipelago—taken by Dr. J. Anderson, Penang (Coll. Moore), Hong Kong—taken by J. J. Walker, R.N., and from Hainan (type of *Confucius*).

"This is a widely distributed species, occurring in the Himalayas, from Masuri and eastwards as far as Upper Assam, in Silhet, Cachar, and Tenasserim" (Butt. Ind. ii. 308).

Mr. W. Doherty obtained it in "Eastern Kumaon at Askot and the lower Kali, 2000 to 5000 feet elevation" (J. As. Soc. Beng. 1886, 134). Mr. G. C. Dudgeon obtained and reared the larva at Badamtan near Darjiling, the butterfly swarming in the District (Proc. As. Soc. Beng. 1890, 138). "It is excessively common in Sikkim from 1000 to 6000 feet, almost throughout the year. The larva feeding on several species of *Mæsa*" (L. de Nicéville, Sikk. Gaz. 1894, 149). Col. C. Swinhoe records it from the Khasia Hills (Tr. Ent. Soc. 1893, 291).

Col. C. H. E. Adamson records it as being "found generally throughout Burma, and is sometimes found near Bhamo in great quantities in August and September. It is found throughout the year, and is subject to great variation in the extent of the white markings on the upper side" (Lists, 1889, 1897, pp. 20, 28). Dr. N. Manders found it "abundant throughout the Shan States" (Tr. Ent. Soc. 1890, 526). Dr. J. Anderson obtained it in the Islands of the Mergui Archipelago from November to March (Proc. Linn. Soc. Zool. 1886, 38). Cramer's figure (*l.c.*), representing a *wet-season* male, is recorded from China, and Fabricius's type of *Allica*, from Siam, is a *wet-season* female. Mr. J. H. Leech obtained it in W. and C. China. Mr. L. de Nicéville says "it occurs right across China to near Ningpo on the East Coast" (Sikk. Gaz. 1894, 149). Mr. J. J. Walker found it "very common in Hong Kong, especially in April and May, but stray specimens occur throughout the winter months. It frequents sunny paths and roadsides, and has a rapid flight, settling on leaves with wings extended and slightly raised" (Tr. Ent. Soc. 1895, 459).

MALAYAN SPECIES.—*Zemerus Javana* (Syn. *Z. Phlegyas*, Fruhstorfer, Berl. Ent. Zeit. 1897, p. 333. *Z. Allica*, Boisd. Spéc. Gén. Lép. pl. 21, fig. 5, ♂ (*wet*). *Dry-season form*. Male. Upperside distinguishable from *N. Indian*, Burmese and Chinese, dry form of *Flegyas*, on both wings, in the outer-discal series of pale spots being diffused and obscurely apparent across each wing. Female also with the same series of spots distinctly defined but sullied ochreous or ochreous-white, those on the forewing being larger and dentate, and extend uniformly across the wing on both the upper and underside. Expanse, ♂ ♀  $1\frac{7}{10}$  inch. *Habitat*. Java. Specimens of both sexes of this species, taken in Java, by the late Dr. T. Horsfield, are in the British Museum and our own collection. A female also from Java, taken by Wallace, is in Mr. F. Godman's collection.

*Zemerus sparsus*, Fruhstorfer, Berl. Ent. Zeit. 1897, p. 332. *Habitat*. Nias.—*Zemerus retiarius*, Grose-Smith, Nov. Zool. ii. p. 505 (1895); Rhop. Exot. Dic. pl. 2, figs. 8, 9 (1901). *Habitat*. Sumbawa; Lombok.—*Zemerus strigatus*, Pagenstecher, Jahrb. Nassau, ver Nat. 1896, p. 149, pl. 3, fig. 5. *Habitat*. Sumba.—*Zemerus albipunctata*, Butler, Cist. Entom. i. p. 236 (1874); Trans. Linn. Soc.

Zool. 1877, p. 545, pl. 69, fig. 10, ♂. Distant, Rhop. Malay. p. 187, pl. 18, fig. 12, ♀ (1883). *Habitat.* Malay Peninsula; Sumatra; Borneo.

GENUS *BARISANA*.—Differs from *Zemerus* in the *forewing* being somewhat longer and narrower, and less triangular, the outer margin less irregular, especially in the female; the cell narrower, and the discocellulars inwardly-oblique. *Hindwing* obtusely oval, the exterior margin obliquely convex and almost even, the anal angle rounded; cell somewhat broader at the base, discocellulars less oblique, the subcostals and two upper median branches emitted at some distance from end of the cell; palpi a little longer, its apical joint visible and conical; antennal club elongated, slender.—*Barisana Emesoides* (*Zemerus Emesoides*, Felder, Ent. Monat. iv. p. 396 (1860); Reis. Novara, Lep. ii. p. 289, pl. 36, figs. 9-11 (1865). Distant, Rhop. Malay. p. 188, pl. 18, figs. 3, 4, ♂ ♀ (1883). *Habitat.* Malay Peninsula; Sumatra; Banka; Borneo.

#### Genus STIBOGES.

*Stiboges*, Butler, Proc. Zool. Soc. Lond. 1876, p. 308. Distant, Rhop. Malayana, p. 193 (1883). de Nicéville, Butt. of India, etc., ii. p. 315 (1886). Staudinger and Schätz, Exot. Schmett. ii. p. 233 (1892). Leech, Butt. of China, i. p. 295 (1893).

IMAGO.—*Forewing* elongatedly-triangular; costa arched at base and towards the end, apex obtusely pointed, exterior margin oblique and slightly convex in the middle, slightly uneven, posterior margin short, angle obtuse; costal vein extending abruptly upward to the margin beyond the middle; cell extending to more than half length of the wing; first and second subcostal branches short, emitted before end of the cell, third at about one-third beyond, fourth at two-thirds and ending at the apex; upper discocellular obsolete, middle and lower discocellular concave, of equal length; upper radial emitted in a line with the subcostal; middle median emitted at some distance before lower end of the cell; submedian vein recurved. *Hindwing* short bluntly-oval; exterior margin very obliquely-convex, slightly uneven, anal angle obtuse; precostal vein short, straight; costal vein very short, terminating on the costa at about one-third from the base; cell large, broad; subcostal branch emitted at some distance beyond end of the cell; discocellulars oblique, upper rather short, lower long and straight, radial from their angle; middle median branch emitted at some distance before lower end of the cell, lower median at more than half. *Body* slender; eyes prominent, naked; palpi very small and slender; *forelegs of male* very short, finely hairy; *forelegs of female* also short, slender, smoothly scaled, terminal joint longest, armed with claws, paronychia and pulvillus; antennæ slender, articulations prominent, club short and spatulate.

TYPE.—S. Nymphidia.



**STIBOGES NYMPHIDIA** (Plate 405, figs. 2, 2a, ♂, ♀).

*Stiboges Nymphidia*, Butler, Proc. Zool. Soc. Lond. 1876, p. 309, pl. 22, fig. 1, ♂. Distant, Rhop. Malayana, p. 193, pl. 24, fig. 11, ♂ (1883). de Nicéville, Butt. of India, etc., ii. p. 316, pl. 24, fig. 119, ♀ (1886). Leech, Butt. of China, i. p. 295 (1893). Staudinger, Exot. Schmett. i. p. 239, pl. 87, ♂ (1888).

IMAGO.—Male and female. Upperside pure white; cilia black alternated with white. Male. *Forewing* with a bluish-black broad costal and outer marginal band, which is irregularly sinuated internally; a submarginal series of white spots, of which the two upper are largest, the next two minute, the lower being obscure; followed by a marginal row of four or five slender spots. *Hindwing* with a very short basal and a broad outer marginal bluish-black band, the latter undulated internally and bearing a submarginal pale denticulated line which sometimes slightly show a whitish point between the veins, followed by a marginal row of slender white lunules. Underside, as above; the dark borders being brownish-black; white outer markings as on upperside.

Female. Upper and underside as in male, except that on the *forewing* the white inner area is broader anteriorly, and the submarginal row of spots distinct; and on the *hindwing* there is also a submarginal row of distinct white spots. Underside as on upperside.

Expanse, ♂  $1\frac{4}{10}$  to  $1\frac{6}{10}$ , ♀  $1\frac{8}{10}$  to  $1\frac{9}{10}$  inch.

HABITAT.—Bhotan; Naga and Khasia Hills; Burma; Malay Peninsula; Sumatra; W. and C. China.

DISTRIBUTION.—Mr. L. de Nicéville (*l.c.*) records “a male from the Khasia Hills and a female from the Naga Hills, in the Indian Museum, Calcutta, and a single female example, taken by Mr. A. V. Knyvett’s native collector, in Buxa, Bhotan, in June.” It is also noted, by the same author, to “occur, but not commonly, in Bhotan, during the summer and autumn” (Sikkim Gaz., 1894, 149). A male, from the Naga Hills, taken by Col. Godwin-Austen, is in the Hewitson collection. A female, taken at Momeit, Upper Burma, at about 2000 feet elevation, by Mr. W. Doherty, and others from Perak, are recorded by Mr. H. J. Elwes (P. Z. S. 1891, 288). A male, taken by Dr. Forbes in Sumatra, is in Mr. H. Grose-Smith’s collection, and a male, also from Sumatra, in Col. C. Swinhoe’s collection. Mr. L. de Nicéville records it as having been found, by Dr. L. Martin, in N.E. Sumatra, only in the Central Plateau, and is rare even there, six specimens only being obtained in thirteen years” (Journ. As. Soc. Beng. 1895, 440). Mr. J. H. Leech has examples from Moupin, W. China, and from Omei Shan, C. China.

ALLIED SPECIES.—*Stiboges calycoides*, Fruhstorfer, Entom. Nachr. 1897, p. 62. *Habitat.* Java.

## Family PAPILIONIDÆ.

- Equites*, Linnæus, Syst. Nat. x. p. 458 (1758); *id.* xii. pt. 2, p. 744 (1767); Mus. Ulr. pp. 182, 200 (1764). Müller, Linn. Nat. Syst. v. 1, p. 565 (1774). Barbut, Gen. Ins. Linn. p. 162 (1781).
- Papilionides* (part), Latreille, Hist. Nat. Crust. et Ins. iii. p. 387 (1802); *id.* iv. pp. 187, 193 (1809). Samouelle, Ent. Comp. p. 234 (1819). Scudder, Syst. Rev. Amer. Butt. p. 37 (1872).
- Papilionida*, (part), Leach, Edin. Encycl. ix. p. 127 (1815). Tutt, Brit. Butt. pp. 86, 215 (1896).
- Papilionideæ* (part), Swainson, Phil. Mag. Ser. 2, i. p. 187 (1827); *id.* Cab. Cycl. p. 86 (1840). Stephens, Illust. Haust. i. p. 5 (1827). Westwood, Intro. Ins. ii. p. 347 (1840). Stephens, Catal. Brit. Lep. B. M. p. 1 (1850). Stainton, Man. Brit. Lep. i. p. 12 (1857). Bates, Journ. Ent. i. p. 219 (1861); *id.* ii. p. 177 (1864). Felder, Acta C. R. Soc. Zool. et Bot. p. 289 (1864). Marsh. et de Nicév. Butt. India, etc. i. p. 18 (1882). Distant, Rhop. Malay. p. 283 (1885). Scudder, Butt. U. S. ii. p. 1026 (1889). Moore, Lep. Ceylon, i. p. 117 (1881); *id.* Lep. Indica, i. p. 3 (1890).
- Papilionides*, Boisduval, Spec. Gen. Lep. pp. 163, 317 (1836). Westw. Introd. Ins. ii. p. 348 (1840). Blanchard, Hist. Nat. Ins. ii. p. 325 (1845).
- Papilionideæ*, Doubleday, Gen. D. Lep. i. p. 1 (1846). Gray, List. Lep. Brit. Mus. pt. 1, p. 1 (1856). Doherty, Journ. As. Soc. Bengal, 1886, p. 110. Lang, Eur. Batt. i. p. 5 (1884). Staudinger and Schütz, Exot. Schmett. ii. p. 38 (1892). Jordan, Nov. Zool. v. p. 383 (1896). Grote, Trans. Ent. Soc. Lond. 1897, pp. 339, 341.
- Equitina*, Herr. Schæffer, Prod. Syst. Lep. p. 7 (1864).
- Equitideæ*, Kirby, Allen's Nat. Labr. Butt. ii. p. 234 (1896).
- Archontes*, Hübner, Verz. bek. Schmett. p. 82 (1816).

## CHARACTERS OF THE PAPILIONIDÆ.

IMAGO.—Of large or moderate size. Discoidal cells always closed. *Forewing* sub-triangular or triangular; subcostal vein either four or five branched; lower radial so positioned as to appear like a fourth branch of the median vein; median vein three branched; median and sub-median vein connected by a short cross veinlet near their base in the *Papilioninæ* and *Leptocircinæ*; submedian with a lower basal short branch or spur extending towards the posterior margin. *Hindwing* subtriangular, or rounded exteriorly, sometimes posteriorly prolonged and the exterior margin with a broad spatular tail, or slender lengthened tail, or tails, more often scalloped or dentated; abdominal margin excised, never forming a channel or gutter for the reception of the abdomen; in some males of the *Papilioninæ* and in the male of *Leptocircinæ*, the abdominal margin is plaited or folded over on the upper surface and there enclosing an androconial tuft of hairs; precostal vein prominent; an interno-basal costal cell always present, though varying in its general shape,\* being formed by the peculiar basal conformation of the costal, subcostal and median vein, in conjunction with an interno-costal veinlet; submedian vein either rather short or ending at the anal angle; internal vein always absent. *Body* rather stout;

\* See J. Watson, Mem. Manchester Lit. and Phil. Soc. 1899, pp. 13-17.

abdomen elongated, anal clasps large and valve-like in the Papilioninæ; head rather large, front nearly square; eyes prominent; palpi generally short, scaled or hairy; antennæ generally rather long, club elongated; six perfect legs in both sexes; forelegs similar to the other pairs; tarsal claws all simple (except in *Leptocircus*, in which they are sometimes bifid) without pulvilli or other appendages; tibia of forelegs furnished with a stout lateral spur (epiphysis) about the middle of the inner side.

EGG.—Dome-shaped, flattened at the base, slightly rugose; more oblate and reticulate in the *Parnassiinæ*.

LARVA.—Adult. Stout; subcylindrical or cylindrical, smooth or granulated, sometimes humped towards the head, not hairy or bristly, but occasionally furnished with rows of fleshy tubercles. Prothoracic segment furnished upon the dorsum with two retractile tentacula (osmateria), which are extended when the animal is irritated or alarmed, and then exhale a strong aromatic scent.

PUPA.—Attached by the tail, generally in an upright position, and secured by a silken girth round the middle of the body; subfolliculate in the *Parnassiinæ*; head bifid, square, subtruncate, or rounded, never pointed.

### Sub-family PARNASSIINÆ.

*Heliconii* (part), Linnaeus, Syst. Nat. x. p. 465 (1758); *id.* xii. 1, 2, p. 754 (1767); *id.* Faun. Suecica, p. 268 (1761).

*Parnassii* (part), Gmelin, Syst. Nat. i. pt. v. p. 2256 (1789). Fabricius, Ent. Syst. iii. 1, p. 181 (1793). Turton, Linn. Syst. Nat. iii. pt. 2, p. 43 (1806).

*Parnassii*, Cuvier, Tabl. Elem. H. Nat. p. 590 (1798). Latreille, Hist. Nat. Cr. et Ins. iii. p. 395 (1802). Wallengren, Lep. Scand. pp. 5, 164 (1853).

*Parnassinæ*, Swainson, Cab. Cycl. pp. 87, 90 (1840). Doherty, Journ. As. Soc. Bengal, 1886, p. 136.

*Parnassiidæ*, Elwes, Proc. Zool. Soc. Lond. 1888, p. 18.

*Parnassidi*, Scudder, Butt. U. S. ii. p. 1224 (1889). Tutt, Brit. Butt. p. 84 (1896).

*Parnassiidæ* (part), Grote, Trans. Ent. Soc. Lond. 1897, p. 339.

*Parnassiine*, Kirby, Allen's Nat. Hist. Butt. ii. p. 236 (1896). Jordan, Nov. Zool. v. p. 385 (1898).

### CHARACTERS OF THE PARNASSIINÆ.

IMAGO.—Wings semidiaphanous. *Forewing* subtriangular, rounded exteriorly; subcostal vein four branched: no connecting basal veinlet between the median and submedian veins. *Hindwing* ovate; with a more or less developed interno-basal veinlet forming a basal costal cell. *Body* short, stout, hairy in the male; female with a corneous anal pouch, produced during coition.

EGG.—Oblate; reticulated.

LARVA.—Cylindrical, slightly tuberculate, pubescent; prothoracic segment

furnished with a Y-shaped retractile tentacle (osmateria), which exhales a strong aromatic scent when the animal is alarmed.

PUPA.—Subcylindrically conical, subfolliculate, being loosely enclosed among leaves in a slight silken web, supported also by some transverse threads.

### Genus PARNASSIUS.

*Parnassius* (part), Gmelin, Syst. Nat. i. pt. v. p. 2256 (1789).

*Parnassius*, Latreille, Hist. Nat. Cr. et Ins. xiv. p. 110 (1805); *id.* Consid. Gen. Cr. et Ins. p. 440 (1810); Encyc. Méth. ix. p. 9 (1819). Cuvier, Rég. Anim. iii. p. 550 (1817). Lamarck, Hist. Nat. Anim. iv. p. 32 (1817). Boisduval, Spéc. Gén. Léop. i. p. 394 (1836). Doubleday, Gen. D. Lep. i. p. 26 (1847). Felder, Acta C. R. Soc. Z. et Bot. 1864, p. 327. Austaut, Les Parnas. p. 16 (1889). Staudinger and Schätz, Exot. Schmett. ii. p. 48, pl. 3 (1892). Leech, Butt. China, etc. ii. p. 491 (1893). Kirby, Allen's Nat. Hist. Butt. ii. p. 236 (1896).

*Doritis*, (part), Fabricius, Illiger's Mag. vi. p. 283 (1807).

*Parnassis*, Hübner, Verz. bek. Schmett. p. 90 (1816).

*Therius*, Dalm. in Billberg's Enum. Ins. p. 75 (1820).

IMAGO.—Wings semidiaphanous; rather broad. Male. *Forewing* subtriangular, rounded exteriorly; costal vein extending to two-thirds the margin; cell extending to half length of the wing; subcostal vein four branched, first branch emitted at about one-third before end of the cell, second at a short distance before the end and terminating at the apex, third and fourth at nearly half distance beyond end of the cell; upper discocellular veinlet absent; the upper radial being emitted beyond end of the cell, middle discocellular extending obliquely inward, concave, long, lower discocellular short, straight, and inwardly oblique; lower radial so positioned as to appear like a fourth median branch; median branches equidistant apart; submedian vein slightly recurved, and with a lower basal short branch extending to the posterior margin. *Hindwing* broad, ovate; costal margin much lobed at the base, exterior margin very convex, abdominal margin long, curved inwardly, not channelled; precostal vein stout and straight, truncate at the tip; costal vein much arched from the base, and with a weakly-developed interno-basal veinlet forming a basal costal cell; discoidal cell extending to about half the wing; first subcostal branch emitted at one-fourth before end of the cell; upper discocellular veinlet longest, radial from the angle; median veinlets equidistant apart, lower emitted at one-third before end of the cell; submedian vein rather short, straight. *Body* short, stout, very hairy in the male; abdomen of the female furnished with a small horny anal pouch, stated to be produced during coition; head small, front hairy; palpi porrect, scaled above, clothed beneath with long hairs; antennæ short, rather stout, with a stout cylindrical club, shaft laxly clothed with narrow scales. Legs rather short, coarsely scaled above; femora beneath hairy; tarsi longer than the

tibiæ, five-jointed, each joint with a row of short lateral spines, basal joint equal in length to the others together, fore tibiæ with a short flat spur (epiphysis) on the inner side, and two terminal slender spines; middle and hind tibiæ also with two terminal spines; all the tarsi with two terminal long sharp approximated claws on fifth joint, the inner claw shortest, base of the claws with a horny projection beneath.

EGG.—Oblate; reticulated.

LARVA.—Cylindrical, slightly tuberculate, pubescent; retractile tentacle (osmateria) Y-shaped. Feeds on Sedum, Saxifrages and Fumitories.

PUPA.—Subcylindrically conical; subfolliculate, being loosely enclosed among leaves in a slight silken web, supported also by some transverse threads.

The species of *Parnassiinæ*, occurring in our area, are almost exclusively confined to the higher outer ranges of the Northern Himalaya Mountains. The commonest of our species (*P. Hardwickii*) is found in its known local haunts of the N.W. Himalayas from about 7500 to 15,000 feet elevation, and, according to the observations of Capt. A. M. Lang "there appear to be two broods of this species—early spring and late autumn"\* (P. Z. S. 1865, 48). Capt. Graham Young also states that it is "undoubtedly double-brooded—the second brood appearing in August and September, and a few even in October in favourable seasons; some of these hibernate, reappearing in March along with the spring brood—which has hibernated in the pupa—of this fact I have no doubt. When coming over the Rhotang Pass about October 10th I saw numbers of the larvæ of *Hardwickii* on the low herbage, and have no doubt myself but that some of this species hibernate as butterflies, but by far the greater number in the pupa. That this insect is double-brooded no one who knows its habits disputes" (P. Z. S. 1886, 38).

**PARNASSIUS JACQUEMONTII** (Plate 406, figs. 1, 1a, b, c, ♂, 1, d, e, ♀).

*Parnassius Jacquemontii*, Boisduval, Spec. Gén. Lép. i. p. 400, ♂ only (1836). Blanchard, Jacq. Voy. Ind. Ins. p. 16, pl. 1, fig. 4, nec fig. 3 (1844). Oberthür, Etud. Ent. iv. p. 23, pl. 2, fig. 5, ♂ (1879); *id.* xiv. p. 10, pl. 2, fig. 11, ♂ (1891). Mackinnon and de Nicéville, Journ. Bombay Nat. Hist. Soc. 1898, p. 596.

*Parnassius Himalayensis*, Elwes, Proc. Zool. Soc. Lond. 1886, p. 30. Oberthür, Etud. Ent. xiv. p. 10, pl. 2, fig. 12, 13, ♂ ♀ (1891).

IMAGO.—Male. Upperside yellowish-white; fringe of both wings very slightly intersected with black at end of the veins, in some apparently entirely white; antennæ black, basally annulated with grey. *Forewing* with the base, costal and

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\* In the W. Himalayas the *dry hot-season* extends from April to June, the *rainy-season* commencing at end of June—ceasing about the end of August, and the *cold-season* sets in about the middle of November.

posterior margin and the vein-borders, on the disc, from the cell more or less numerously speckled with black scales; a broad deep black bar across middle of the cell and a similar discocellular bar, the latter not always reaching the first subcostal branch; beyond are two upper-discal obliquely-superposed black spots, which are more or less connected by intervening black scales, these two spots being either entirely black or centred more or less with either pale or bright red, in some specimens the lower spot only is red centred; below is a similar spot above the submedian vein, which latter is also either entirely black or red centred; beyond is a submarginal more or less well-defined black-scaled sinuous transverse band, followed by a broader and paler marginal uniform band extending to the extreme edge. *Hindwing* with the base and abdominal margin deeply black scaled, in most specimens these scales also extend more or less round the end of the cell, in some they terminate in the lower median interspace; above the anal angle is a single, or more generally, a duplex patch of black scales, the lower patch being generally red-centred; a subbasal, a costal, and a discal, more or less irregularly-rounded black-bordered spot, of either pale ochreous or bright-red, the two latter spots generally being white pupilled; beyond is a submarginal series of black lunules, which are either narrow or broad and dentate, followed by a paler marginal uniform band. Underside duller yellowish-white, glossy; black markings similar to those of the upperside but much less defined. *Forewing* with the two upper and the lower discal spot more or less centred with red. *Hindwing* with the costal, and a discal red spot, as on the upperside, but each are very slightly edged with a few black scales, the two latter generally being white-pupilled; there are also either two, or more generally three, subanal red spots, the second one being the largest and is often white-pupilled, also, there is a basal series of four similar edged red spots.

Female. Upperside similar to the male. *Forewing* with the discal area generally more numerously speckled with black scales, the two upper discal and the lower spot being brighter red-centred. *Hindwing* with the basal, costal, discal, and the two anal spots larger, more prominent, and brighter red, of the latter the upper one is sometimes entirely black; the submarginal black dentate lunules in some specimens are broader and confluent. Underside similar to the male; the red spots larger, as on upperside, and brighter red. Anal pouch small, with a sharp curved keel at the base, ovally scoop-shaped anteriorly and convex beneath.

Expanse, ♂ ♀  $2\frac{6}{10}$  to 3 inches.

HABITAT.—N.W. Himalayas.

DISTRIBUTION and HABITS.—Capt. A. M. Lang writes (Epist. Nov. 18, 1874): "This species does not appear until, passing up the Sutlej, we emerge from Kunawur into Hungrung—the lower course of the Spiti, and Gughe in Chinese Tibet, 14,000 to 18,000 feet elevation. Hungrung Pass and Kongma Pass above

Shipki, ground not often trodden by Europeans." "It replaces *Hardwickii* on the high Passes of Upper Kunawur, Spiti, and Tibet. I first saw it on the Kongma Pass, leading from Kunawur into the Chinese province of Gughe in Tibet. This Pass is 16,000 feet elevation, but I ascended up its flank another 2000 feet, and here I saw this *Parnassius* coursing rapidly up and down the frozen snow-beds, where beaches, as it were, of boulders and stones cropped out. What could tempt it there, I know not, for I saw not a *Sedum*, Saxifrage, nor any other vegetation. I met with this species again at high elevations in similar regions along the confines of Kunawur and Tibet. It does not occur, apparently, with *Hardwickii*" (*id.* Proc. Zool. Soc. 1865, 408). Major H. B. Hellard records its capture on the "Rupin Pass, North side, in September" (MS. Notes). Rev. J. H. Hocking took it at the "head of the Kulu Valley and the slopes of the Rhotang Pass, 10,000 to 13,000 feet elevation" (P. Z. S. 1882, 257). Mr. W. Doherty obtained it at "Pala, Thidikhar, and Taglakhar, in Chinese Tibet, N.E. Kumaon, at 13,000 to 16,000 feet elevation." Mr. P. W. Mackinnon records it as "not so common as *Hardwickii*, and occurs at higher elevations nearer the snows, further in the interior. We have specimens taken in the Nila Valley and Nila Pass, and from the Nilung Pass, in July and August, at elevations from 12,000 to 15,000 feet" (Journ. Bombay Nat. Hist. Soc. 1898, 596). Specimens of both sexes are in Mr. J. H. Leech's Collection, taken at Kokser, Lahoul, and Spiti in August, by Capt. McArthur. Others from Dugi Pass and Keyling, 12,000 feet, taken in August and September by Capt. Thompson.

**PARNASSIUS CHITRALENSIS** (Plate 406, figs. 2, 2a, ♂).

MALE.—Upperside white; fringe of the forewing very broadly alternated with black, of the hindwing entirely white. *Forewing* with the base, costa, and posterior margin sparsely black scaled; the ordinary cell and discocellular bar deep black, the inner-discal transverse sinuous band ill-defined and sparsely black speckled, its two upper spots blacker bordered and centred with either rich bright scarlet or pale vermilion, its lower spot either entirely black or centred with pale vermilion; medial-discal band more defined, narrow and sinuous; the outer marginal band paler and uniformly extending to the extreme edge. *Hindwing* with the basal area dark black; the black-edged subbasal and the costal spot small and oval, the discal spot being narrow transversely, reniform, its black edge being slightly dentate inward and pointed outward, each centred with either rich bright scarlet or pale vermilion; the subanal broken black bar slightly centred with either one, or two, pale red spots, or are entirely black; submarginal row of black dentate lunules, the paler outer band extending to extreme margin.

FEMALE.—Similar to the male.

Expanse, ♂ ♀  $2\frac{4}{10}$  to  $2\frac{6}{10}$  inches.

HABITAT.—Chitral, N.W. of Kashmir.

Described from three males in the collection of Mr. H. Grose-Smith. Specimens of both sexes, taken by Capt. G. H. Colomb in July and August, 1891, in the Shishi Kuh Valley, Chitral, at from 9000 to 14,000 feet elevation, are also in the British Museum.

**PARNASSIUS NIRIUS** (Plate 407, fig. 1, ♂, 1a, ♀).

MALE and FEMALE.—Upperside white; fringe alternated with black.

MALE.—*Forewing* with the cell bars and discal spots black, the two upper discal spots narrow and very slightly centred with pale red; submarginal sinuous band continuous, the marginal band broad and extending uniformly to the extreme outer edge, as in *Jacquemontii*, the intervening white lunular spaces being small; the median veinlets slightly bordered with black scales on the disc. *Hindwing* with the basal, costal, and discal spot small, ovate, and centred with pale red; submarginal lunules narrow; marginal band broadly diffused.

FEMALE.—Similar to the male. *Forewing*. Upper discal spot red centred; marginal bands broad, the submarginal diffusely speckled inwardly between the veins, the marginal extending uniformly to the extreme outer edge. *Hindwing* with the basal, costal, and discal spot bright red; the submarginal lunules and diffused marginal band as in the male.

Expanse, ♂  $2\frac{2}{10}$ , ♀  $2\frac{4}{10}$  inches.

HABITAT.—Ladak.

The male type specimen (our fig. 1) is in the Felder Collection in the possession of the Hon. W. Rothschild, and was taken by the late Dr. F. Stoliczka at Niri Lumdo, in Karnag, Ladak, at 12,000 to 13,000 feet elevation. This specimen is probably one of the males referred to by Herr Honrath, in his description of *P. Rhodius* (Stett. Ent. Zeit. 1882, 178), as being in the Coll. Felder. The female type (fig. 1a) is from Skoro La, taken by Mr. Leech in July, 1887, and is in the possession of Mr. F. Godman. A female from Karakoram, 18,000 feet, taken in July, 1889, by Capt. McArthur, is in the Leech Collection, now at the British Museum.

**PARNASSIUS IMPUNCTATA.**

*Parnassius Jacquemontii*, var. *impunctata*, Austaut, Le Naturaliste, 1899, p. 154, ♂.

MALE.—“Size of *Par. Delius*; of a very flat pure white, upon which the spots and the powdery scales on the forewings are cut in strongly; the spots of the premarginal band are reduced, disjointed, especially on the hindwings, where they show a tendency to become effaced; neither of the two costal spots or the internal spot are pupilled with red. There is no carmine punctuation at the base of the



hindwings, nor the anal spot; the ocelli are very small, of a sombre red, largely circled with black, and without white central pupil; fringe grey, without intersection; antennæ black, jointed with grey.

“HABITAT.—Sikkim Alps.”

### PARNASSIUS EPAPHUS.

*Wet-season brood* (Plate 407, figs. 2, 2a, ♂ ♀).

*Parnassius Jacquemontii*, Blanchard, Voy. Ind. Ins. pl. 1, fig. 3, ♂ (*see* fig. 4).

*Parnassius Jacquemontii*, Gray, Catal. Lep. Brit. Mus. Pap. p. 75, pl. 12, fig. 1, 2, ♂ ♀ (1852).

Elwes, Proc. Zool. Soc. Lond. 1886, p. 36, pl. 2, fig. 1 (*pouch*).

*Parnassius Epaphus*, Oberthür, Etudes Ent. iv. p. 23 (1879); *id.* xiv. p. 12, pl. 1, fig. 4, 5, ♂ ♀ (1891). Elwes, Proc. Zool. Soc. Lond. 1882, p. 399.

IMAGO.—Wings narrower and more triangular in shape than in *Jacquemontii*; the apex being more pointed and the exterior margin oblique.

MALE.—Upperside yellowish-white; fringe of both wings broadly intersected with black at end of the veins. Antennæ black, the shaft being distinctly annulated with grey. *Forewing* with the base and costa thickly black scaled; a black short bar across middle of the cell, a discocellular larger bar, two upper-discal partly connected spots, the upper one being crimson centred, and a black lower discal somewhat hastate shaped spot, followed by a submarginal greyish-black sinuous band, and a marginal similar band, the outer edge of the latter being excavated between the veins. *Hindwing* with the basal area deep black, the anal streak speckled; a prominent basal, costal, and a discal black-edged crimson-centred spot, followed by a submarginal row of sharply-defined black dentate marks, and a marginal row of black speckled lunules. Underside pale greyish-white, glossy. *Forewing* with markings as on upperside, but less-defined, the upper discal spot centred with pinkish-white. *Hindwing* also with less-defined markings; the four basal black-edged spots, the costal and discal, and three anal smaller triangular spots are deep crimson bordered within and centred broadly with pale pink scales, the two lower anal spots with black scales; between the costal and discal spot is a short black oblique streak.

FEMALE.—Upperside. *Forewing* with somewhat darker and broader markings than in the male; the upper discal connected spots either entirely black or crimson-centred; below these are some black scales extending to the lower discal black spot. *Hindwing* with the basal black portion and the other markings more prominent than in the male; the crimson spots somewhat larger; some crimson scales sometimes being present within and below base of the cell, and on the lower anal spot; below the costal spot extends a narrow black oblique streak, which in some is continued to the costal spot. Underside glossy; with less-defined markings, as on upperside.

*Forewing* with the two upper discal spots either entirely black, or dark crimson bordered within and centred with pale pink scales. *Hindwing* with the basal spots, the costal, discal, and three anal spots as in male; the blackish oblique streak between the costal and discal spot being also present. Anal pouch similar to that in *Jacquemontii*, but not keeled at the base.

Expanse, ♂ ♀  $2\frac{4}{10}$  to  $2\frac{6}{10}$  inches.

*Dry-season brood* (Plate 407, figs. 3, 3a, 3b, ♀).

*Parnassius Epaphus*, var. *Cachemiriensis*, Oberthür, *Études Ent.* xiv. p. 14, pl. 1, fig. 6, 7, ♂ ♀ (1891).

MALE and FEMALE.—Upperside with clearer white tint of colour than in the wet-season form.

MALE.—*Forewing* with the base of the costa less speckled with black scales; cell bars and the two upper discal spots similar, the latter each or the upper one only centred with very pale ochreous or red, or both are black; the lower discal spot small, slender, and entirely black; the marginal sinuous bands less defined, the submarginal very narrow. *Hindwing* with the basal area less intensely black; the basal, costal, and discal spot smaller, centred with pale ochreous or red; the submarginal marks slender, less-defined, lunular or slightly dentate, the marginal indicated by slight speckled linear clusters at end of the veins.

FEMALE.—Upperside. *Forewing* with the cell bars and discal spots prominent, the marginal bands well-formed and broader than in the male, the submarginal slightly speckled within the median interspaces; basal, costal, and discal spot larger than in the male, the marginal markings more prominent.

Expanse, ♂ ♀  $2\frac{2}{10}$  to  $2\frac{6}{10}$  inches.

HABITAT.—N.W. Himalayas.

DISTRIBUTION.—Specimens of both sexes of this species are in Mr. J. H. Leech's Collection from the Kutie Pass, E. of Dalhousie, taken at 17,000 feet elevation in September, from the Chonging Valley, 15,000 to 17,000 feet, taken in July and August, the Kardong Pass, 15,000 to 17,000 feet, S. of Leh, and the Baralacha Pass, taken in August, by Capt. McArthur. Also from the Deosai Plains, 13,000 feet, taken in August, and from Skoro La, N. of Skardo, taken in July, by Mr. Leech. Major H. B. Hellard also obtained it in the "Deosai Plains, at 13,000 feet elevation, in July" (MS. Notes). Mr. L. de Nicéville records it as "common on the northern side of the Darkot Pass, at about 12,000 feet elevation, and not uncommon on the southern slopes of the Great Pamir, at about 15,000 feet elevation" (Rept. Pamir Boundary Comm. 1898, pp. 16, 43).

Of our illustrations on Plate 407, figs. 2, 2a are from a male and female, *wet-season*, typical specimen taken by Major Charlton, which were formerly in the

Saundersian Collection, but now in the possession of Mr. H. Grose-Smith; fig. 3 is a *dry-season* male from Deosai, taken by Major Hellard, fig. 3a of a male from Skoro La, in Mr. W. Rothschild's Collection, and fig. 3b of a female from Skoro La, in Mr. F. Godman's Collection.

**PARNASSIUS SIKKIMENSIS** (Plate 407, fig. 4, 4a, ♂ ♀).

*Parnassius Epaphus*, var. *Sikkimensis*, Elwes, Proc. Zool. Soc. Lond. 1882, p. 399, pl. 25, fig. 4, ♀, 5 ♂; *id.* 1886, p. 37. Alpheraky, Rom. Mem. v. p. 65 (1899).

**MALE and FEMALE.** Distinguishable from typical W. Himalayan *Epaphus* by its smaller size; fringe alternately black and white. Upperside. *Forewing* with the submarginal sinuous black band narrower, marginal band excavated outwardly between the veins, the two upper discal spots and the lower spot centred with very pale red or deep red, in some both, or the second only of the upper pair, is entirely black. *Hindwing* with the basal, costal, and discal black-edged spots smaller, and centred with either paler red or deep red; the short black streak between the costal and discal spot, present in *Epaphus*, is absent in both sexes. Underside glossy. *Forewing* with markings on the upperside. *Hindwing* with similar markings as in *Epaphus*, the short black oblique streak between the costal and discal spot, absent.

Expanse, ♂ ♀ 2 to 2 $\frac{1}{10}$  inches.

**HABITAT.**—Sikkim-Tibet frontier.

**DISTRIBUTION.**—Mr. H. J. Elwes records this species as “occurring at great elevations on the frontier of Sikkim and Tibet. I took it myself on an unnamed Pass which was crossed from the Upper Lachong Valley, in Sikkim, to the Cholamoo Lake in Tibet, at an elevation of nearly 19,000 feet, in September, 1870” (*l.c.* p. 37). Specimens of both sexes are in the British Museum from E. Tibet, taken by Capt. F. C. Colomb, during the Sikkim-Tibet Comm. of 1895.

Our illustrations on Plate 407, figs. 4, 4a are from male and female typical specimens taken by Mr. Elwes.

**PARNASSIUS HARDWICKII.**

*Dry-season brood* { Plate 408, figs. 1, 1a, b, c, d, e, ♂, 1f, g, ♀.  
 { Plate 409, figs. 1, 1a, b, c, d, e, ♂, 1f, g, ♀.

*Parnassius Hardwickii*, Gray, Zool. Misc. i. p. 32 (1832); *id.* Lep. Ins. Nepal, p. 7, pl. 4, figs. 1, 1a (1846); *id.* Catal. Lep. Brit. Mus. Pap. p. 76, pl. 12, figs. 8, 9, 10, 11 (1853). Boisd. Spec. Gén. Léop. i. p. 400 (1836). Moore, Proc. Zool. Soc. Lond. 1865, p. 488. Staudinger, Exot. Schmett. i. pl. 14 (1884). Elwes, Proc. Zool. Soc. Lond. 1882, p. 401; *id.* 1886, p. 38, pl. 2, fig. 5 (*pouch.*)

*Parnassius Jacquemontii*, Kollar, Hügel's Kaschmir, iv. Ins. p. 407, pl. 2, figs. 3, 4, ♂ (1844).

*Parnassius Hardwickii*, var. *albivans*, Fruhstorfer, Berl. Ent. Zeit. 1898, p. 147. (*Hot-season form.*)

*Parn. Hardwickii*, abr. *afar*, Fruhstorfer, Stett. Ent. Zeit. 1899, p. 354. (*Cold-season form.*)

IMAGO.—Male. Upperside white or creamy-white; fringe white. *Forewing* with the base and costal border black speckled; a black cell and a discocellular bar, an inner-discal upper narrower sinuous bar and a lower spot above the submedian veinlet, the upper bar being either entirely black, or more generally, it has a lower or an upper and lower pale or deep scarlet central spot, the intervening discal interspace across the medians being either entirely free, or it is sometimes traversed by a more or less slightly apparent, or a distinctly defined sinuous row of black scales, these scales, in others, also slightly border the median veinlets; beyond is a submarginal slightly recurved row of black spots, the upper four being connected, the lower three or four smaller; followed by a sinuous inner-edged marginal paler black band which decreases posteriorly. *Hindwing* with the base and abdominal margin and anal bar black scaled, these scales extending outward, in some specimens, below and within end of the cell; a costal and a discal black-edged spot centred with pale or deep red, these two spots varying in size and shape, the costal spot being lunate or oval, the discal triangular or irregularly angled, sometimes very small and entirely black, and rarely obsolete; beyond is a submarginal curved row of five, or six, ocelli, which are black-edged, dark blue centred, and pupilled with white scales, these latter spots are more or less round or oval, the lowest and the two, or three, upper being the smallest, the uppermost minute or absent, the latter sometimes not pupilled with white scales; beyond, the outer margin is either clear or very slightly lunularly speckled with blackish scales. Underside glossy, very slightly olivescenscent-yellow tinted; the base very sparsely black scaled; marginal markings of the upperside being visible by transparency. *Forewing* with the black cell bars shorter, the upper discal spots and the lower discal spot centred with bright scarlet. *Hindwing* with the basal blackish-speckled area more or less thickly interspersed with bright scarlet scales; the costal, discal, and anal macular bar with slender black scaled edge, pale or bright scarlet centre and white pupil.

Female. Upperside creamy-white; marked similar to the male, except that in the *forewing* the submarginal macular band is generally more or less continuous and of uniform width throughout; the sinuously disposed black scales across the disc being more distinct, and on the *hindwing* a basal pale red spot is sometimes present, and the anal bar is sometimes slightly centred with pale or bright red. Underside. Similar to the male, but more distinctly tinted with olivescenscent-yellow. Anal pouch rather larger and broad, somewhat triangular, laterally concavely-compressed, and grooved along the middle beneath.

In some examples of both sexes, the black markings and the red spots on the upperside, are more intensified, the basal areas more thickly and broader black

scaled, and on the disc of the forewing these scales are more numerous; the anal bar on the hindwing extending to the discal red spot.

Expanse, ♂ 2 to  $2\frac{8}{10}$ , ♀  $2\frac{4}{10}$  to  $2\frac{6}{10}$  inches.

*Wet-season brood* (Plate 410, figs. 1, 1a, b, c, ♂, 1d, e, f, g, ♀).

*Parnassius Charino*, Gray, Catal. Lep. Brit. Mus. Pap. p. 76, pl. 12, figs. 13-15 (1852).

MALE and FEMALE.—Upperside. *Forewing* with the base, and more or less the discal area covered with black scales, in some specimens these scales being uniformly disposed over the wing; the whitish borders of the submarginal macular band are more or less lunularly-defined, or are obscure on both sides; the two upper discal spots and the lower spot prominently pale red or deep scarlet centred; in the interspace between the cell and discocellular bar a slender linear transverse row of black scales is generally present. *Hindwing* with the black basal area and anal bar broad, or more generally these black scales extend over the disc and more or less numerous to the outer margin; the submarginal row of ocelli are generally larger and more prominent; the costal and discal spot is either pale red or deep scarlet; and generally, a basal and an anal spot of the same colour is also present.

Underside. MALE. Glossy; dull greyish-white; basal and discal areas very sparsely speckled with black scales; marginal markings visible by transparency. *Forewing* with the black cell bars prominent, the intervening speckled line generally slightly apparent; the costal spots and the discal black-edged spot are pale dull red or bright vermilion. *Hindwing* with the costal, discal, the anal continuous spots, and the basal series of spots are very slenderly and sparsely edged with black scales, and are centred with dull red or bright vermilion, and, except the basal series, are white pupilled.

FEMALE.—Glossy. *Forewing* with the basal area greyish-white, the outer border tinted with clear olive-yellow; markings similar to the male. *Hindwing* tinted with clear olive-yellow; basal, costal, discal, and anal vermilion spots prominent and white pupilled; submarginal row of white spots distinct, and they are sometimes slightly edged with black scales. Anal pouch the same as in dry-season form.

Expanse, ♂ ♀  $2\frac{4}{10}$  to  $2\frac{6}{10}$  inches.

HABITAT.—N.W. and E. Himalayas.

DISTRIBUTION and HABITS.—Capt. A. M. Lang (*Epist.* November 18th, 1874) writes, "I have this species (*Hardwickii*) from all along the main Cis Sutlej watershed, from about 8000 to 15,000 feet elevation; also Trans Sutlej on the Spurs running downwards from Spiti. Even in Simla itself in midwinter, December, and January, with deep snow all around." "It commences to appear at the Runang Pass, becoming commoner South and West towards Lower Kunawur and Simla, but

not extending nearer the Plains than Simla, however. It is tolerably abundant on the Mahasoo ridge near Simla, on bare grassy hill-tops, just clear of Oak-woods; grassy, open downs it certainly affects, and at a high elevation—8000 feet. It appears very local, and has a slow flight, somewhat like that of *Pieris*, although it has a strong as well as a slow flight. It flies low over the turf and rocks which crop up amidst the grass. There appear to be two broods—early spring and late autumn. I have seen it in December and February, on bright days succeeding weeks of snowstorms” (*id.* P. Z. S. 1865, 488). “It is common above 7500 feet. It flies nearly all the year. I have seen it at Simla when deep snow lay in December. Beginning at Simla, where, on the Peak of Jako—the Simla Hill, 8000 feet, it flies in March and April, to the Hungrung Pass, overlooking the bleak, bare Spiti Valley, and facing the Tibetan ranges, it is to be caught on all grassy summits; if close to snow, so much the more is *Hardwickii* abundant on the Runang Pass, 14,800 feet elevation” (*id.* Epist. July 7th, 1865). Mr. P. W. Mackinnon records it as “very common in April, and from July to September in the interior, of the Western Himalayas, to the North of Masuri, from 10,000 to 12,000 feet elevation; especially so in the valleys near the Nilung and Nila Passes” (Journ. Bombay N. H. Soc. 1898, 595). Mr. W. Doherty obtained it on the Bireg Mountain and the Pindari Valley, N.W. Kumaon, and in the Byans Valley, N.E. Kumaon; at 10,000 to 15,000 feet elevation” (Journ. As. Soc. Bengal, 1886, 136). Major H. B. Hellard took *Hardwickii* on the Rupin Pass, N. side, in September, and in Kashmir in September, also near Simla and Masuri in July and September, and the form *Charino* also on the Rupin Pass in September” (MS. Notes).

Capt. Graham Young, writing from Kulu, says:—“Undoubtedly *P. Hardwickii* is double-brooded; the second brood appears in August and September, and a few even in October in favourable seasons; some of these hybernate, reappearing in March along with the spring brood, which has hybernated in the pupa—of this fact I have no doubt. When coming over the Rhotang Pass about October 10th, 1874, I saw numbers of the larvæ of *P. Hardwickii* on the low herbage, and have no doubt myself but that some of this species hybernate as butterflies, but by far the greater number in the pupa; that this insect is double-brooded no one who knows its habits disputes; the larvæ feed on various species of Saxifrage. In the outer Himalaya (I speak of Kulu only) it does not vary; but in the interior it varies from typical *Hardwickii*, through light and dark grey, to the higher-level form *Charino*” (Elwes, Proc. Zool. Soc. 1886, 38).

In the British Museum Collection are the type-specimens of both forms (*Hardwickii* and *Charino*), taken by Major Charlton, in Ladak. Others from Kharga, N.W. Himalaya, 14,000 feet, taken in August; Rehan Valley, 12,000 feet, August; Dalhousie, August and September, taken by Major Harford; males from

Nepal, taken by Gen. T. Hardwicke and Gen. Hearsey; both sexes from Sikkim-Tibet, taken by Capt. F. C. Colomb during the Commission of 1895.

In Mr. J. H. Leech's Collection are specimens of the *dry-season* form from the N.W. Himalayas, viz.:—Narkunda, 8000 to 9000 feet, April; Dana, N.E. of Dalhousie, June; Kokser in Lahoul, 11,000 feet, July and August, taken by Capt. McArthur; Dugi Pass, 12,000 feet, August and September; Kutie Pass, E. of Dalhousie, 8500 feet, July, taken by Capt. Thompson; Deosai Plains, August, and Goorais Valley, May, taken by Mr. Leech. Of the *wet-season* form, Kutie Pass, 8500 feet, July; Dugi Pass, 12,000 feet, August and September (Capt. Thompson); Kokser, Lahoul, and Goorais Valley, August and September, taken by Mr. Leech.

Mr. H. J. Elwes records it as "not uncommon in the higher ranges of the interior of Sikkim, but not obtained in British Sikkim" (Tr. Ent. Soc. 1888, 438). Mr. L. de Nicéville records it as "common on the higher ranges in the interior of Sikkim. It is very variable; the blackest specimens of the species I have ever seen have come from Sikkim, others again are very light coloured" (Sikkim Gaz. 1894, 175).

Of our illustrations of this species, Plate 408 represent the *dry hot-season* form; figs. 1 and 1g, a male and female from Sikkim (Coll. Müller), taken in June, from Mr. W. Rothschild's Collection; figs. 1a, b, c, d, e, males, and 1f, female, from Lower Kunawur and Simla. Those on Plate 409 represent the *dry cold-season* form; figs. 1, 1a, b being males from Sikkim and Nepal, identical with type of *Afer*, Frust.; 1c, d, e, males, and 1f, g, females, from the N.W. Himalayas. Plate 410 represents the *wet-season* form (Charino), figs. 1, 1a being males from N. Kashmir and Gurhwal, 1b, c, males from Sikkim, and figs. 1d, e, f, g, females from Sikkim, Nepal, and Gurkwal.

C. ASIA, TIBET, and N. CHINA SPECIES.—*Parnassius Rhodius*, Honrath, Berl. Ent. Zeit. 1882, p. 178, pl. 2, fig. 6, ♂; *id.* 1885, p. 274. *Habitat.* S. Samarcand.—*Parnassius Romanovii*, Gr.-Gr. Horæ Soc. Ent. Ross. 1888, p. 303. Austaut, Les Parnas. pp. 111, 203, pl. 10, fig. 3, ♂, Suppl. pl. 5, fig. 3, ♀ (1889). Elwes, Proc. Zool. Soc. 1886, p. 41. *Habitat.* S. Kokand.—*Parnassius Cæsar*, Gr.-Gr. Rom. Mem. ii. p. 247 (1885); *id.* iv. p. 187 (1890). Elwes, Proc. Zool. Soc. 1886, p. 41. *Habitat.* Alai Pamir.—*Parnassius Tibetanus*, Oberthür, Etudes Ent. xix. p. 3, pl. 8, fig. 66, 67. Leech, Butt. China, etc., p. 496. *Habitat.* Tehang Kou, E. Tibet.—*Parnassius Poeta*, Oberthür, Et. Ent. xvi. p. 2, pl. 2, fig. 9 (1892). *Habitat.* E. Tibet.—*Parnassius Davidis*, Oberthür, Et. Ent. iv. pp. 23, 108, pl. 2, fig. 2, ♂ (1879); *id.* xiv. p. 2, pl. 1, fig. 3, ♀. Leech, Butt. China, etc., ii. p. 498. *Habitat.* N. China.—*Parnassius Orleans*, Oberth. Et. Ent. xiv. p. 8, pl. 1, fig. 2, ♂ (1891); *id.* xvi. p. 3, pl. 2, fig. 14, ♀ (1892). Leech, *l.c.* ii. p. 502. *Habitat.* E. Tibet; C.W. China.—*Parnassius Nanchanica*, Austaut, Le Naturaliste, 1899, p. 285. *Habitat.* Nanchan, N.E. Tibet.—*Parnassius Tsaidamensis*, Austaut,

Le Nat. 1898, p. 106. *Habitat.* Tsaidam, E. Tibet.—*Parnassius Szeckenyii*, Frivaldzsky, Term. Fuz. Magyar Nem. Muz. 1886, p. 39, pl. 4, fig. 1, 1a, ♂. Oberth. Et. Ent. xvi. pl. 2, fig. 11, ♂, 13, ♀ (1892). Leech, *l.c.* ii. p. 501. *Habitat.* E. Tibet.

#### Genus TADUMIA.

IMAGO.—Male. *Forewing* comparatively narrow and elongatedly triangular, the apex somewhat pointed, exterior margin very oblique; cell more than half length of the wing; second subcostal branch emitted at some distance before end of the cell and anastomosed to the first for some distance before its end; discocellulars inwardly-oblique, upper either very short or obsolete, middle discocellular long and concave, lower bent inward; upper radial from angle of discocellular or in a line with the subcostal. *Hindwing* short, very convex exteriorly; precostal vein short and thick. Antennal club gradually thickened, tip blunt. Female with the anal pouch wedge-shaped, long and dependent beneath, sides narrowly quadrate and flattened, its lower end almost straight and keeled.

TYPE.—T. ACCO.

#### TADUMIA ACCO (Plate 411, fig. 1, ♂, 1a, b, c, ♀).

*Parnassius Acco*, Gray, Catal. Lep. Brit. Mus. Pap. p. 76, pl. 12, fig. 5, 6, ♂ ♀ (1852). Bates, Henderson and Hume's Lahore to Yarkand, p. 305, fig. (1873). Elwes, Proc. Zool. Soc. Lond. 1882, p. 400; *id.* 1886, p. 35.

MALE and FEMALE.—Upperside and fringe yellowish-white. *Forewing* powdered with black scales at the base and along the posterior margin; a black bar across middle of the cell and a similar discocellular excurved bar; generally a narrow incurved slightly apparent speckled inner cell bar is also present; beyond are three pale greyish-black transverse bands, the inner band narrow, recurved, very sinuous, and more or less speckled with white scales, and also, occasionally, its anterior end is centred with a few red scales, the middle band is less sinuous and broader, the outer band being marginal. *Hindwing* with the base and abdominal margin densely and broadly but irregularly black scaled; a subbasal, costal, and discal black-bordered spot, each being centred either with red or yellow, those of the red colour sometimes being pupilled with yellow, and the discal spot sometimes has the centre entirely white; between the subbasal and discal spots a cluster of black scales of more or less extent is generally present, and a small cluster of red scales is apparent, in some females, at the angle of the black scaled area within the cell; a submarginal row of six black more or less conical spots, of which the two upper are the largest; followed by a marginal blackish narrow lunular band. Underside paler and duller coloured, markings similar to the upperside, but less prominent; basal interspaces of the hindwing sprinkled with grey scales. Anal pouch of female wedge-shaped, very short from the base to front, long and dependent beneath, its lower edge



almost straight and keeled, the sides flattened and narrowly quadrate from base to keel.

Expanse, ♂ ♀  $2\frac{2}{10}$  to  $2\frac{4}{10}$  inches.

HABITAT.—Ladak; W. Tibet; Sikkim-Tibet Frontier.

DISTRIBUTION.—The type-specimens were obtained in Ladak at 16,000 feet elevation by Major Chariton. A female, from Ladak, taken by Mr. F. E. S. Adair, and both sexes taken on the Barren Mount, W. Tibet, in July, are also in the British Museum. Four males from N.W. Karakoram, 18,000 feet elevation, taken in July, by Capt. McArthur, and three males from S.W. Tibet, taken at 17,600 feet, are in Mr. J. H. Leech's Collection. Both sexes from Lapsang (or Lakzung), S. of the Karakoram Pass, about 17,500 feet elevation, also on the summit of the Pass, 19,600 feet, in July, 1870, taken by Mr. R. B. Shaw on his journey to Yarkand, are in Mr. F. Godman's Collection, and a female taken in the Samunda Pass, 17,000 feet, near Lake Tsomoriri, in Ladak, by Dr. Stoliczka, is in the "Felder" Collection at Tring. Mr. H. J. Elwes records a specimen, which he refers to this species, received by him from the Sikkim-Tibet Frontier (P. Z. S. 1886, 35).

On our Plate 411, figs. 1 is a male, and 1a, b, a female, from Lapsang, and 1c, also a female, from the Samunda Pass.

**TADUMIA SIMO** (Plate 411, fig. 2, ♀).

*Parnassius Simo*, Gray, Catal. Lep. Brit. Mus. Pap. p. 76, pl. 12, fig. 3, ♀, 4, ♂ (1852). Elwes, Proc. Zool. Soc. Lond. 1886, p. 35. Oberthür, Etudes Ent. xiv. p. 14, pl. 1, fig. 8, 9 (1891).

MALE.—Upperside yellowish-white; fringe greyish-black on forewing, white on hindwing; antennæ black. *Forewing* with the base and costa slightly black speckled; a black broad bar across middle of the cell, and a broader discocellular bar, the latter being widest in the middle; a greyish-black transverse inner-discal sinuous partly speckled narrow band; a medial-discal more regular sinuous band, and then a marginal band. *Hindwing* with the base and abdominal border densely black speckled, the speckles extending broadly outward to a point below the cell as far as the radial; a costal small black spot very slightly centred with pale red, and a discal spot entirely black; followed by a submarginal row of narrow dentate lunules, and then a very narrow outer marginal band. Underside glossy; markings as on the upperside, except that on the hindwing the costal and discal spot is slightly centred with red; also with a basal black-speckled streak within the cell, and one below the cell, the former being slightly red centred.

FEMALE.—Upperside. Both wings with similar markings as in male, except that on the hindwing the costal and discal spot are each distinctly centred with pale red. Underside paler, glossy; markings also much paler. On the hindwing the costal and discal spot are each centred with brighter red, and there is a black-edged streak within the cell, and a similar one below base of the cell. Fringe as in male.

Expanse, ♂ 2, ♀ 1 $\frac{8}{10}$  inch.

HABITAT.—Ladak.

DISTRIBUTION.—The type-specimens, in the British Museum, were taken by Major Charlton at 16,000 feet elevation, in Ladak, or Chinese Tartary, as it was called in those days. A specimen in the Hewitson Collection, two others in Mons. Oberthür's Collection, and one female in Mr. H. Grose-Smith's Collection, all taken by Major Charlton, are the only examples known.

Our illustration on Plate 411, fig. 2, is from the female in Mr. H. Grose-Smith's Collection.

C. ASIAN SPECIES.—*Tadumia Simonius* (Parn. Simonius, Staudinger, Stett. Ent. Zeit. 1889, p. 16. Gr.-Gr. Rom. Mem. iv. pl. 21, fig. 3, a, b, c (1890). *Habitat.* Turkestan.—*Tadumia Simulator* (Parn. Simulator, Staudinger, Stett. Ent. Zeit. 1889, p. 18). *Habitat.* C. Asia.

#### Genus KAILASIUS.

IMAGO.—Male. *Forewing* more elongated than in typical *Parnassius* (Apollo); subtriangular, exterior margin more oblique; cell longer; second subcostal branch arising from end of the cell and anastomosed to the first branch before its end; discocellulars outwardly-oblique, upper short, middle long and slightly concave, lower short and bent inward, the two radials from their angles. *Hindwing* elongated; exterior margin very convex and somewhat outwardly produced in the middle; precostal vein slightly bent near the tip. Antennæ stouter, shaft smoothly scaled, club thick. Female with the anal pouch large, broad beneath, tubular, and circularly horn-shaped.

TYPE.—K. Charltonius.

#### KAILASIUS CHARLTONIUS (Plate 411, figs. 3, ♂, 3a, b, ♀).

*Parnassius Charltonius*, Gray, Catal. Lep. Brit. Mus. Pap. p. 77, pl. 12, fig. 7, ♀, (1852). Moore, Second Yarkand Mission, Lep. p. 5, pl. 1, fig. 3, ♀ (1879). Elwes, Proc. Zool. Soc. Lond. 1886, p. 43, pl. 3, fig. 5 (*pouch*). Austaut, Les Parnas, Suppl. p. 188, pl. 5, fig. 1, 2, ♂ ♀ (1889).

MALE.—Upperside yellowish-white; fringe white. Body above black, densely clothed with long fine grey-tipped hairs; head and thorax in front and palpi above interspersed with short olive-grey hairs; collar, body and palpi beneath clothed with yellowish-white hairs. Antennæ black. *Forewing* with the base speckled with black scales, these scales being thickly clustered across the cell; the cell and discocellular bar dense black and broad; inner-discal transverse zigzag band broadest at each end, more or less densely black scaled; the two outer bands paler, greyish black, the submarginal narrow, irregular and sinuous, the marginal broad. *Hindwing* with the base, abdominal margin, and anal bar thickly black scaled and

clothed with fine long greyish-white hairs; a costal black-edged small spot, and a very large discal more or less rounded spot, both centred with either pale dull red or dark crimson, the discal spot being pupilled with a cluster of pure white scales; beyond is a pale grey-black irregular submarginal and a narrow marginal regular band, the submarginal bearing five large black oval or conically-oval spots, which are thickly speckled anteriorly with distinct blue-grey scales. Underside duller white, glossy; both wings marked as on upperside, but less prominently. *Hindwing* also with a subbasal black-speckled irregular band extending broadly from the costal vein and then more narrowly along end and across the cell; costal and discal spot centred with dark reddish-purple, the anal bar sometimes also being slightly speckled with reddish-purple scales.

FEMALE.—Upperside similar to the male, except that on the *forewing* the inner-discal zigzag band is somewhat narrower, and on the *hindwing* the costal and discal and the anal bar are each centred with pale dull red. Underside as in the male, except that on the *hindwing* the base and abdominal margin is speckled with white scales, and the anal bar, as on upperside, is centred with dark reddish-purple. The thorax and abdomen above is deep black, the latter with a few pale hairs, and slender white segmental bands. Anal pouch large, circularly horn-shaped, tubular, equally broad beneath, flattened and transversely wrinkled along its middle, and the sides convex, from base to apex.

Expanse, ♂ ♀  $3\frac{3}{10}$  to  $3\frac{5}{10}$  inches.

HABITAT.—Ladak; N.W. Himalayas.

DISTRIBUTION and HABITS.—The type-specimen, a female, from Ladak, taken by Major Charlton, a female, also from Ladak, taken by Mr. F. E. S. Adair, both sexes from the Shishi Kul Valley, 9000 to 14,000 feet elevation, Chitral, taken in July and August, by Col. Lorne Campbell and Capt. G. H. Colomb, and a female from Runang Pass, 14,000 feet, Kumaon, in Coll. Hewitson, are in the British Museum. A male from Kokon, Laboul, in Mr. F. Godman's Collection; two females from Kashmir in Mr. P. Crowley's Collection. Both sexes from Kokser, Lahoul, 12,000 to 14,000 feet, taken by Capt. Graham Young, in Mr. W. Rothschild's Collection; and a female, from Kharbu, 13,000 feet, Ladak, taken by Dr. Stoliczka, in our own Collection. Capt. A. M. Lang records it as "a rare species. I caught it in July, on but two Passes, the Runang and Hungrung—at the former in company with *P. Hardwickii*, and at the latter with *Pontia Nina*. I saw many more than I caught, for, as may be imagined, rapid pursuit, now up a steep hill-side, now down, and then up again, at 14,000 to 15,000 feet altitude above the sea, is trying to the best of lungs. This species has a peculiar flight, swimming very fast and close to the ground in a zigzag course, as if beating the ground like a hen harrier beating a meadow" (Proc. Zool. Soc. 1865, 488). Mr. P. W. Mackinnon records it as "rare ;

flying in July and August at great elevations, above 14,000 feet, on the inner ranges of the Hills North of Masuri just below the snows" (Journ. Bombay Nat. Hist. Soc. 1898, 596). The Rev. J. H. Hocking found it "very rare on the Baralacha Pass, 18,000 feet elevation" (Proc. Zool. Soc. 1882, 257). Major H. B. Hellard took it on the "Runang Pass, S. side, 13,500 feet, in August, also between the Sarsunyar and Stakpila Passes, 12,000 to 13,000 feet, in July" (MS. Notes). Mr. L. de Nicéville records it from the "Northern side of Darkot Pass, about 12,000 feet elevation" (Rept. Pamir Boundary Comm. 1898, 43). In the collection of the late Mr. J. H. Leech are specimens, taken by Capt. H. McArthur, at Kokser in July, at the Chonging Valley, 15,000 to 17,000 feet elevation, July and August, Baralacha, August, and from the Kutie Pass, 17,000 feet, September; others from the Dugi Pass, 12,500 feet, taken by Capt. Thompson in September; Mr. Leech himself having taken it at Skoro La in July, and in the Deosi Plains in August.

ALLIED SPECIES.—*Kailasius Princeps* (Parn. Princeps, Honrath, Berl. Ent. Zeit. 1887; p. 351. Gr.-Gr. Rom. Mem. iv. pl. 2, fig. 1, a, b, c, ♂ ♀ (1890). Austaut, Les Parnas, pl. 16, fig. 1, 2, ♂ ♀ (1891). *Habitat.* S.E. Turkestan.

#### Genus KORAMIUS.

IMAGO.—Male. *Forewing* somewhat narrow, subtriangular; exterior margin obliquely rounded; cell extending to half the wing; second subcostal branch emitted at a short distance before end of the cell, free from the first branch; upper discocellular short, middle concave, lower bent inward. *Hindwing* somewhat elongated; exterior margin obliquely convex; precostal vein curved outward. Antennæ with a lengthened gradually thickened club. Female with the anal pouch small, broad beneath, basally concave, the apex being convexly dilated and obtusely pointed on each side.

TYPE.—K. Delphius.

#### KORAMIUS STOLICZKANUS (Plate 412, fig. 1, ♂, 1a, b, ♀).

*Parnassius Stoliczkanus*, Felder, Reise Novara, Lep. ii. p. 138, ♂ ♀ (1865); *id.* iii. pl. 67, figs. 2, 3, ♂ (1867).

*Parnassius Stoliczkanus* (part), Elwes, Proc. Zool. Soc. Lond. 1886, p. 40.

MALE.—Upperside yellowish-white; fringe of both wings entirely yellowish-white; antennæ black. *Forewing* with the base and costa blackish speckled; a broad black wedge-shaped bar across middle of the cell, and a broader discocellular bar, followed outwardly by three much paler greyish-black transverse bands, the inner band narrow, recurved, sinuous and not reaching the submedian, the middle band also sinuous and broadest at the ends, the outer band being marginal. *Hindwing* with the base and abdominal margin thickly black speckled; a discal

black-edged vermilion spot, placed somewhat outwardly between the radial and upper median veinlet, and extending slightly below the latter; closely beyond is a broad outer marginal blackish-grey band, which is traversed by five small black spots. Underside glossy, paler; with less defined markings as on the upperside.

FEMALE.—Upperside duller coloured throughout; fringe entirely yellowish-white. *Forewing* with markings as in male, except that the cell bars are slightly narrower, and the inner-discal band does not extend below the upper median veinlet. *Hindwing* with the outer-marginal band paler, the five black spots more distinctly defined and sparsely centred with blue scales; the discal spot slightly larger and paler vermilion; a small blackish-speckled bordered pale vermilion anal spot being present between the submedian and abdominal edge. Underside glossy, paler; markings as on the upperside. In another female, from Kulu, the discal red spot on the hindwing is obsolete, being represented, on both the upper and underside, only by a small cluster of blackish scales, and the anal spot is also less apparent. Anal pouch small, broad beneath, concave at the base, very convexly dilated posteriorly in front and excavated in the middle.

Expanse 2 to  $2\frac{2}{10}$  inches.

HABITAT.—Marka, Rupshu, Ladak.

DISTRIBUTION.—Dr. Felder's types, from which our description is made, and the Kulu example of the female are in Mr. W. Rothschild's Collection. Mr. H. J. Elwes (*l.c.*) records three specimens, taken by Mr. L. de Nicéville on the Baralacha Pass, north of Lahoul, at 18,000 feet elevation in July, 1879.

Captain A. M. Lang (Epist. November, 1874) records it as "occurring in exactly the same ground as *Charltonius*, on the Runang and Hungrung Passes, in July. I only secured two specimens. They fly nearly alike, low, fast, and zigzag, quite differently from *Hardwickii* and *Jacquemontii*."

Of our illustrations of Plate 412, fig. 1, 1a are from the male and female types, and fig. 1b from the Kulu example, in Mr. W. Rothschild's possession.

#### KORAMIUS ATKINSONI (Plate 412, fig. 2, ♀).

FEMALE.—Larger than *Stoliczkanus*. Upperside pale greyish-white. *Forewing* with narrower black cell bar and discocellular bar, the inner-discal recurved sinuous-edged grey-black band broader and continued to the submedian vein, the outer-discal and marginal band being similar. *Hindwing* with a small costal black spot, very slightly centred with red, or entirely black; a large black-bordered red discal spot which extends from the radial to, or near, the middle median veinlet, below which is a black-edged red duplex anal spot; the grey-black marginal band traversed by five prominent black spots, the lower four of which are centred more or less distinctly with bluish-white scales. Underside duller greyish-white, with less defined blackish-

grey bands ; the hindwing with similar black-edged red discal and duplex anal spot, and with prominent marginal bluish-white centred spots. Fringe of forewing white, broadly alternated with black at the vein ends ; of the hindwing entirely white. Anal pouch similar in shape to that in *Delphius*.

EXpanse, ♀,  $2\frac{4}{10}$  inches.

HABITAT.—Pir Pinjal, N. Kashmir.

Described from two females in the "Hewitson" cabinet, British Museum. These specimens being from the late Mr. W. S. Atkinson's Collection, and are indicated in my MS. catalogue of the latter collection, which was compiled whilst in my possession at the India Museum, before it passed into Mr. Hewitson's hands.

**KORAMIUS STENOSEMUS** (Plate 412, figs. 3, 3a, ♂, 3b, c, ♀).

*Parnassius Delphius*, var. *Stenosemus*, Honrath, Entom. Nachr. xvi. p. 127 (1890).

MALE and FEMALE.—Larger than *K. Stoliczkanus*, markings blacker. Upper-side. *Forewing* with broader cell and outer black bands, the inner-discal band being recurved and broadly angulated inward at the lower median veinlet. *Hindwing* with a discal prominent black spot more or less centred with red ; the small anal black streak, narrow and simply black speckled or obsolete ; the costal spot entirely black ; a submarginal continuous row of blackish-bordered black spots, the lower four being more or less centred with bluish-grey, these black spots also being separated from the narrow black marginal band. One male has the inner-discal recurved black band, on the forewing, broken below the upper median veinlet, and on the hindwing the discal spot is smaller and almost entirely black, the submarginal row of spots also being smaller and entirely black. One female also differs in the submarginal row of spots on hindwing being smaller and entirely black. Fringe in both sexes alternated with black in the forewing, entirely white in the hindwing. Antennæ black. Anal pouch, seen from above, with the two lower apices more rounded and the upper lateral edges more even than in *Stoliczkanus*.

EXpanse, ♂ ♀,  $2\frac{4}{10}$  to  $2\frac{7}{10}$  inches.

HABITAT.—Kutie Pass, E. of Dalhousie, Ladak.

Described from eleven specimens, six males and five females in Mr. J. H. Leech's Collection, taken on the Kutie Pass, E. of Dalhousie, at 17,000 feet elevation, in September, by Capt. McArthur, and a male and female from Upper Kashmir, in Dr. Felder's Collection at Tring, and a male, from Ladak, in Mr. P. Crowley's Collection.

C. ASIA AND TIBET SPECIES.—*Koramius Delphius* (Doritis *Delphius* Eversm. Bull. Mosc. 1843, p. 541, pl. 7, fig. 1a, b. *Habitat.* Altai.—*Koramius Staudingeri* (Parn. *Staudingeri*, Haas, Berl. Ent. Zeit. 1882, p. 163, pl. 2, fig. 7, ♂, 8, 8a, ♀.

*Habitat.* N. Samarcand.—*Koramius Cardinal* (Parn. Cardinal, Gr.-Gr. Rom. Mem. iii. p. 397, *id.* iv. p. 201, pl. 2, fig. 2a-d, ♂ ♀. *Habitat.* Pamirs.—*Koramius Hunza*, (Parn. Hunza, Gr.-Gr. Rom. Mem. iv. p. 205, pl. 10, fig. 1, 1a, ♂ ♀ (1890). *Habitat.* Hunza, Hindu Kush.—*Koramius Elwesi* (Parn. Elwesi, Leech, Ent. 1893, p. 104; *id.* Butt. China, etc., p. 504, pl. 33, fig. 4 ♂ (1893). Oberth. Etud. Ent. xix. p. 3, pl. 8, fig. 72 (1894). *Habitat.* Hou Kow, E. Tibet.—*Koramius Imperator* (Parn. Imperator, Oberthür, Bull. Soc. Ent. Fr. 1883, p. 79; *id.* Etud. Ent. ix. p. 11, pl. 1, fig. 4, ♀ (1886); xiv. pl. 1, fig. 1, ♂ (1891). Elwes, Proc. Zool. Soc. 1886, p. 42, pl. 3, fig. 4 (*pouch*). Leech, Butt. China, etc., ii. p. 505. *Habitat.* E. Tibet.—*Koramius Imperatrix* (Parn. Imperatrix Alpheraky, Rom. Mem. ix. p. 230, pl. 12, fig. 2, ♂ (1897). *Habitat.* Nanchau, N.E. Tibet.

Genus DORITIS, Fabricius,\* Illiger's Mag. vi. p. 283 (1807). Scudder, Proc. Amer. Acad. Arts et Sci. Boston, 1875, p. 158. IMAGO. Male. *Forewing* short, broad, sub-triangular; apex rounded, exterior margin oblique, convex; cell broad, more than half length of the wing; second subcostal branch emitted before end of the cell, third and fourth at half beyond the end; upper discocellular erect, long, concave; upper radial from beyond end of the cell, lower radial appearing as a fourth median branch. *Hindwing* short, broad; apex convex, exterior margin somewhat convexly produced in the middle; precostal vein straight, pointed at the tip; costal vein with a weakly developed interno-basal veinlet (strongly developed in *D. glacialis*), forming a basal costal cell. Antennal club slender. Anal pouch of female large, longitudinally elongated, broad laterally, curved from the base and rounded beneath. *Type.* *D. Mnemosyne*.—*Doritis Mnemosyne*. Linn. (Fabricius, Illiger's Mag. vi. p. 283 (1807). *Habitat.* Europe.—*Doritis Citrinarius* (Par. citrinarius, Motsch. Bull. Mosc. 1866, i. p. 189. Leech, Butt. China and Japan, ii. p. 506, pl. 33, fig. 5, 6, ♂ ♀ (1893). Par. glacialis, Butler, Journ. Linn. Soc. Zool. ix. p. 50 (1866); *id.* Lep. Exot. pl. 34. Pryer, Rhop. Nippon, p. 5, pl. 3, fig. 5 (1886). *Habitat.* Japan; W. and C. China.—*Doritis Tartarus*, Austaut, Le Naturaliste, 1895, p. 39; *id.* 1896, p. 74. *Habitat.* W. Tibet.

### Sub-family THAIDINÆ.

*Thaidina*, Kirby, Allen's Nat. Hist. Butt. ii. p. 242 (1896). Jordan, Nov. Zool. v. p. 384 (1898).

Watson, Manchester Lit. and Phil. Soc. 1899, p. 5.

*Thaidi* et *Luehdorfiidi*, Tutt, Brit. Butt. p. 84 (1896).

*Thaidina*, Grote, Trans. Ent. Soc. Lond. 1897, p. 339.

*Parnassii* (part), Latreille, Hist. Nat. Crust. et Ins. iii. p. 395 (1802).

\* Two species only (*Apollo* and *Mnemosyne*) are mentioned under DORITIS by Fabricius, i.e.; *Apollinus* therefore cannot be taken as the type. Scudder (Hist. Sketch. Gen. Butt. p. 117) says that *Apollinus* may be taken as the type of Hübner's ARCHON.

## CHARACTERS OF THE THAIDINÆ.

IMAGO.—*Forewing* triangular; subcostal vein five branched; median and submedian vein not connected by a short cross veinlet near the base. *Hindwing* generally short; exterior margin dentated or tailed; precostal vein and basal interno-costal cell present. *Body* generally slender; palpi long, projecting beyond the front; antennæ short; legs moderately long, tibia of forelegs with a lateral spur; tarsi with two long juxtaposed claws.

LARVA (Thais).—Cylindrical, rather short; with a subdorsal, lateral, and a sublateral row of short fleshy spinous tubercles on each side, and a nuchal Y-shaped tubercle on the front segment.

PUPA.—Cylindrically conical, somewhat angular in front. Attached by the tail and a girth round the middle.

## Genus ARMANDIA.

*Armandia*, Blanchard, Comptes Rend. lxxii. p. 809 (1871). Oberthür, Etudes Entom. ii. p. 18 (1876); Staudinger and Schatz, Exot. Schmett. ii. p. 51, pl. 3 (1892). Leech, Butt. of China, etc. ii. p. 489 (1893). Kirby, Allen's Nat. Hist. Butt. ii. p. 247 (1896). *Blutantis*, Atkinson, Proc. Zool. Soc. Lond. 1873, p. 570.

IMAGO.—*Forewing* elongated, somewhat narrow and triangulate; costa very slightly arched from the base, apex rounded, exterior margin very oblique, posterior margin short; costal vein extending to three-fourths the margin; cell long, reaching fully to half the wing; first subcostal branch emitted at one-fourth before end of the cell, second at an equal distance between it and the end, third at one-fourth beyond the cell, fourth and fifth at about one-half beyond; discocellulars inwardly oblique, upper very short, middle concave, upper radial from the angle, lower discocellular and radial appearing as a fourth median branch, the radial being arched; median veinlets equidistant apart, lower recurved; submedian vein straight, and with a basal lower short branchlet. *Hindwing* with the anterior margin rather short, elongated posteriorly, exterior margin convex, dentated, with a lengthened tail from the upper median and a shorter narrower tail from the lower median veinlets; precostal vein curved inward; costal vein short; interno-basal costal cell, broad, oval; discoidal cell long, extending to fully half the wing; first subcostal emitted at one-fifth before end of the cell; discocellulars outwardly oblique, radial from near lower end. *Body* somewhat slender, clothed with fine hairs; front of head hairy; palpi porrect, slender, extending beyond the front, clothed with fine hairs; legs moderately long, slender, tarsal claws long; forelegs rather smoothly scaled above, femur finely hairy beneath, tibia shorter than the femur, laxly scaled beneath, and with a prominent lateral spur, fore tarsi long, terminal joint with two long juxtaposed claws, the outer claw being slender and shortest, their base having



a rounded protuberance in front beneath; antennæ short, articulations distinct, club very gradually thickened.

TYPE.—A. Thaidina.

**ARMANDIA LIDDERDALII** (Plate 413, figs. 1, 1a, ♂, ♀).

*Bhutanitis Lidderdalii*, Atkinson, Proc. Zool. Soc. Lond. 1873, p. 570, pl. 50, ♂.

*Armandia Lidderdalii*, Kirby, Syn. Catal. D. Lep. Suppl. p. 808 (1877); *id.* Allen's Nat. Hist. Butt. ii. p. 247 (1896).

IMAGO.—Male and female. *Forewing* elongated, somewhat narrow and triangulate; costa very gradually arched, apex rounded, exterior margin very oblique and slightly convex, posterior margin short. Upperside black. *Forewing* with the cell crossed by four slender white bars at equal distances apart, and with a fifth similar bar beyond the cell; the first and second bar continued in wavy scalloped lines to the posterior margin, the third and fourth with a small white partly-attached loop or circlet below the cell, a similar loop also below the fifth bar; followed by two transverse medial-discal inwardly-oblique slender white-speckled scalloped lines, and then a submarginal more distinct and even scalloped line; the outer veinlets also longitudinally slightly speckled with white scales. Cilia white. *Hindwing* black, elongated, lobate; anterior margin very long, oblique; exterior margin very convex, anteriorly dentated, and with three lengthened narrow tails from the median veinlets, the outer one longest; abdominal margin very long, incurved posteriorly and longitudinally grooved along inner edge of the submedian vein; veins from the base to the disc white lined; a slender white line also extending along edge of the submedian groove; an outwardly-oblique white line from the costa to lower median veinlet, two broken lines from the costa to the lower radial, and three outer less-defined speckled white lunular lines, the two inner being conically-looped below end of the cell and from thence extending to the submedian vein; the inner-discal area from the radial occupied by a large broad deep crimson sinuous-edged patch, followed by a lower intense purple-black patch bearing two large ill-defined purplish-grey speckled spots edged inwardly with white scales; beyond which is a marginal series of five ochreous-yellow lunules, the two upper being narrow and palest, the vein along the tails being also lined with ochreous scales. Cilia greyish-white. Underside of both wings similar to the upperside, but with the white lines slightly broader. On the hindwing the crimson patch is paler, the marginal ochreous lunules broader, and between the latter and the extreme outer edge is a slender grey lunule; a slender white subbasal cross curved-bar and two longitudinal fine lines within the cell, and an oblique cross-bar from near base of the lower median veinlet to the submedian; the groove line is also present. *Body* black; thorax laterally edged with grey hairs; abdomen with two lateral slender white

lines, and segmental rings, the tip being pale ochreous; palpi black above, clothed beneath with grey hairs; legs and antennæ black.

Expanse, 4 to 4 $\frac{8}{10}$  inches.

HABITAT.—Bhotan; Naga Hills; Chin Hills, Burma.

DISTRIBUTION AND HABITS.—This butterfly was first discovered by Dr. R. Lidderdale, of the Bengal Army, in May, 1868, at Tchinchula [Choonchula], at 5000 feet elevation, on the Poonaka Road, six miles from the Fort of Buxa, in Bhotan. He also obtained two fresh specimens, taken in the same locality, in 1872, by Lieut. H. M. Rose, Bengal Staff Corps, from one of which Mr. Atkinson's type description and figure was taken. About a dozen specimens were also obtained by Colonel T. Taylor in the same locality near Buxa. Several examples have also been taken at Buxa by Mr. G. C. Dudgeon. Mr. W. Doherty obtained it in the Naga Hills in 1889, and writes:—"It was first observed about August 10th, in the beautiful uninhabited Zulla Valley, the border country between the Angami tribe and the Kachla Nagas, ten to fifteen miles from Kenoma, in the direction of Khonoma. It generally kept to the ridges, occasionally descending into the Valley, once almost down to 5000 feet. Afterwards I found it on the western side of Tapoo, at 7000 to 8000 feet, and between these two places we got one or two every day. At Mao, in Manipur, I have taken worn specimens at 7500 to 9000 feet. My Lepchas, who collected at Buxa, in Bhotan, say there is no chance of another brood. Strange to say, I have never seen a female. The butterfly drifts along among the tree-tops, rarely descending to the ground; the crimson of the hindwing is not so conspicuous as one might think, and if one loses sight of it for an instant it is very hard to make out again, its transparent dark grey wings being hardly distinguishable among the shadows, and it is blown about by the wind, more like a dead leaf than a living insect. Its flight is much like that of *Hestia*, but less buoyant and circling, as might be expected from its angular wings; nevertheless its resemblance strikes one. Seen from above it must be more conspicuous, and is no doubt a protected insect; at the same time its weak flight may even add to its chance of escape, as it certainly does with *Hestia*, for it is impossible to calculate the direction in which it is making. The whole body and wings give out a delicious odour, which remains for some days after death. In some positions and at some distance it looks like *Danaïd Tytia*, which is very common in the same places. *Armandia* hovers about flowers, like other Papilios. During rain it alights on a leaf, and droops its forewings over the hind ones, thus covering the bright colours. Several were taken in this way; but I confess I only caught one myself, as I have not the patience to do as my men do, and watch one of these lovely butterflies for hours and follow it over these steep jungly hills, on the very small chance of catching it finally" (Proc. Zool. Soc. 1891, 251). Captain E. Y. Watson records "a single specimen taken at Fort White,

North Chin Hills, at 7000 feet elevation in September, and other specimens also taken at a similar elevation in the South Chin Hills in the same month" (J. Bombay N. H. Soc. 1897, 673).

CHINA AND JAPAN THAIDINÆ.—*Armandia Thaidina*, Blanchard, Comp. Rend. 1871, p. 809. A. Thaitina, Oberthür, Etud. Ent. iv. p. 18, pl. 1, fig. 1 (1876), *id.* xi. p. 14 (1886). Leech, Butt. of China, ii. p. 489 (1893). Staud. and Schatz, Exot. Schmett. ii. p. 51, pl. 3 (1892). *Habitat.* W. China.

Genus SERICINUS, Westwood, Trans. Ent. Soc. Lond. 1851, p. 173; *id.* Gen. D. Lep. p. 530 (1852). Gray, P. Z. S. 1852, p. 71. Leech, Butt. of China, ii. p. 484 (1893).—*Sericinus Telamon* (Pap. Telamon, Donovan, Ins. China, pl. 27, fig. 1 (1798). Westwood, *l.c.* p. 174, Gray, Catal. Lep. B. M. i. p. 78, pl. 13, fig. 4 (1852). Ménetr. Catal. Mus. Petr. Lep. i. p. 70, pl. 6, fig. 3 (1855). Staud. and Schatz, Exot. Schmett. ii. p. 47 (1886). Leech, Butt. of China, etc. p. 484 (1893). *Habitat.* N. China.—*Sericinus Telmona*, Gray, Proc. Zool. Soc. 1852, p. 72; *id.* Catal. Lep. B. M. i. p. 78, pl. 13, fig. 3 (1852). *Habitat.* China.—*Sericinus Koreana*, Fixsen, Rom. Mem. iii. pl. 13, fig. 1 (1887). Leech, *l.c.* p. 486, pl. 33, fig. 7, ♂. *Habitat.* Korea.—*Sericinus Greyi*, Bremer, Schmett. N. China, p. 6 (1853). Ménetr. *l.c.* pl. 6, fig. 2. Leech, *l.c.* p. 486, pl. 33, fig. 8, ♀. *Habitat.* China.—*Sericinus Cressonii*, Reakirt, Proc. Ent. Soc. Philad. iii. p. 499 (1864). Leech, *l.c.* p. 486. *Habitat.* China.—*Sericinus Montela*, Gray, Proc. Zool. Soc. 1852, p. 71; *id.* Catal. Lep. B. M. i. p. 78, pl. 13, fig. 1, 2 (1852). Leech, *l.c.* p. 485. S. Telamon, Doubleday, Gen. D. L. Suppl. pl. fig. 1. *Habitat.* China.—*Sericinus Fortunei*, Gray, P. Z. S., 1852, p. 72; *id.* Catal. Pap. B. M. i. p. 79, pl. 13, fig. 5 (1852). *Habitat.* C. China.—*Sericinus fasciatus*, Brem. and Grey, Schmett. N. China, p. 5 (1853). Ménetr. Catal. p. 71, pl. 6, fig. 1. *Habitat.* China.—*Sericinus sanguinolentus*, Brem. and Grey. *Habitat.* China.—*Sericinus Amurensis*, Staudinger. *Habitat.* Amurland.

Genus LUEHDORFIA, Crüger, Verh. Ver. Hamb. iii. p. 128 (1878). Leech, Butt. of China, etc. ii. p. 490.—*Luehdorfia eximia*, Crüger, *l.c.* p. 128 (1878). *Habitat.* Amurland.—*Luehdorfia Puziloi*, Erschoff. (Oberthür, Etud. Ent. v. p. 12, pl. 5, fig. 3 (1881). Staudinger and Schatz, Exot. Sch. ii. pl. 3 (1886). *Habitat.* Amurland.—*Luehdorfia Chinensis*, Leech, *l.c.* ii. p. 491, pl. 33, fig. 1, ♀ (1893). *Habitat.* C. China. *Luehdorfia Japonica*, Leech, Entom. 1889, p. 25, pl. 1, fig. 1; *id.* Butt. of China, etc. ii. p. 490, pl. 33, fig. 2, ♀ (1893). L. Puziloi, Pryer, Rhop. Nippon, p. 5, pl. 1, fig. 10 (1886). *Habitat.* Japan.

#### Genus TEINOPALPUS.

*Teinopalpus*, Hope, Trans. Linn. Soc. Lond. xix. p. 131 (1843). Doubleday and Hewitson, Gen. D. Lep. i. p. 2 (1846). Westwood, Arcana Entom. ii. p. 41 (1843). Staudinger and Schatz, Exot.

Schmett. ii. p. 47, pl. 2 (1892). Leech, Butt. of China, ii. p. 509 (1893). Kirby, Allen's Nat. Hist. Butt. ii. p. 248 (1896).

*Teinoprosoopus*, Felder, Verh. Zool. Bot. Ges. xiv. pp. 289, 331 (1864).

IMAGO.—Male. *Forewing* triangular, slightly falcate, costa convex towards the end, apex pointed, exterior margin very oblique, almost even, posterior margin short, the angle obtuse; costal vein stout, extending to three-fourths the margin; first and second subcostal branches at equal distances apart, first branch emitted at about one-fifth before end of the cell, third branch at end of the cell and terminating at the apex, fourth and fifth branch at nearly one-fourth beyond the cell; discoidal cell broad, not reaching to half the wing; upper discocellular veinlet very short, middle discocellular long and slightly concave; upper radial from their angle, lower discocellular and radial appearing as a fourth median branch; median branches equidistant; median vein with an incipient cross-veinlet from below near the base; submedian vein much curved from the base and emitting a lower lengthened basal veinlet. *Hindwing* triangularly-ovate; anterior margin rather long and slightly arched; exterior margin convex, dentated, and with a lengthened slender tail from the upper median in the male, and in the female also with a shorter tail from the radial and lower subcostal; abdominal margin long; precostal veinlet bifid, the inner point short; interno-basal costal cell prominent; discoidal cell long, extending to more than half the wing. *Body* very stout; head large and conically produced in front, hairy; eyes prominent; palpi long, porrect, convergent at the tip, projected beyond the front, basal joint short, second joint long, clothed with scales and long hairs, third joint about half the length of second, pointed, clothed with appressed scales; antennæ short, curved at the tip, gradually clavate, club short and slightly truncate; legs moderately robust; fore tibia with a short stout spur covered by a tuft of hairs; tarsi spiny, first joint about equal in length to the others combined; claws simple, curved.

TYPE.—*T. imperialis*.

**TEINOPALPUS IMPERIALIS** (Plate 414, figs. 1, 1a, ♂, 1b, c, ♀).

*Teinopalpus imperialis*, Hope, Trans. Linn. Soc. Lond. xix. p. 131, pl. 11, fig. 1, 2, ♂ (1843).

Westwood, Arcana Entom. ii. p. 41, pl. 59, ♂ (1843). Doubleday and Hewitson, Gen. D. Lep. i. p. 2, pl. 1, fig. 1, ♀ (1846). Staudinger, Exot. Schmett. i. pl. 14, ♂ (1884). Kirby, Allen's Nat. Hist. Butt. ii. p. 248 (1896).

*Teinopalpus Parryiæ*, Hope, Trans. Linn. Soc. Lond. xix. p. 131, pl. 11, fig. 3, 4 (1843). Westwood, Arc. Ent. ii. pl. 60, ♀ (1843).

IMAGO.—Male. *Upperside*. *Forewing* black, densely covered with golden-green scales, these green scales darkest on the basal area, which latter is edged by a transverse inner-discal outwardly-oblique slightly incurved narrow black line,

beyond which are two medial-discal rather broad less black scaled diffused fasciæ, and a narrow submarginal fascia, the extreme outer margin being black and the cilia pale grey. *Hindwing* black, with the basal area densely covered with dark golden-green scales and edged by a transverse discal undulated black line extending from the costa to near the anal angle, the latter being outwardly bordered from the middle median veinlet by a slender white line, and by an upper inner-discal transversely-irregular orange-yellow band, which is darkest anteriorly, extending from the costa to the middle median veinlet, this band being narrowest anteriorly and outwardly bordered with black, the contiguous discal area below this band being irrorated with pale purplish-grey scales and beyond with green and black scales, followed by three upper submarginal yellow lunules and then a marginal row of narrow green-scaled lunules, the anal one of the latter series being slightly yellow-scaled; tip of tail also yellow. Underside. Basal area of both wings very bright pale green-scaled. *Forewing* with the outer area deep orange-yellow, the transverse black fasciæ narrow and somewhat obsolescent anteriorly, the two medial-discal coalesced posteriorly. *Hindwing* with the upper discal orange-yellow band broader and darker coloured than on the upperside, the outer area and the marginal markings similar, but of a brighter colour. *Body* above and beneath, palpi beneath, and legs black and green scaled; tip of palpi above black; antennæ dark red.

Female. Upperside black. Basal area of both wings less densely green-scaled than in the male. *Forewing* with similar transverse black fasciæ, the green scales being restricted to the medial-discal area and outer margin, the inner and outer-discal transverse interspace being purplish-grey scaled, of either a pale or darkish tint. *Hindwing* with three tails; the upper-discal area (representing the yellow band of the male) being very much broader and extending posteriorly to the abdominal margin, with a black sinuous irregular outer border, its interior upper area being either densely purplish-grey or bluish-grey scaled—in some specimens whitish grey scaled—and with a distinct black discocellular bar at end of the cell, its narrow lower area being either clear pale orange-yellow, or very rarely only speckled with yellow scales; outer border with similar markings to the male, except that the upper lunules are grey; lower tail with yellow tip, upper tail with white tip. Underside. Basal area of both wings bright pale-green scaled. *Forewing* with the outer area purpurescent-grey, the transverse fasciæ black, the interspaces of the submarginal and marginal being dusky orange-yellow. *Hindwing* with the discal and outer area similar to the upperside, except that the discal area is more or less irregularly speckled with black scales, which are most numerous within and beyond the cell, and in some specimens spreading more or less densely to the abdominal margin, occasionally some yellow scales also are sparsely interspersed among the black scales.

Expanse, ♂  $3\frac{6}{10}$  to  $4\frac{4}{10}$ , ♀  $4\frac{6}{10}$  to 5 inches.

HABITAT.—Assam; Naga Hills; Chin Hills.

DISTRIBUTION.—Col. C. Swinhoe has received many specimens of both sexes from Shillong and Cherra Punji, Khasia Hills (Tr. Ent. Soc. 1893, 311). Mr. W. Doherty obtained it in the Naga Hills (P.Z.S., 1891, 251). Capt. E. Y. Watson records this species as being “seen one day in May, flying round Kennedy Peak in the Letha range, Chin Hills, at an elevation of over 8000 feet” (Journ. Bombay N. H. Soc. 1897, 671).

**TEINOPALPUS HIMALAICUS** (Plate 415, fig. 1, 1a, ♂ ♀).

*Teinopalpus imperialis*, var. *Himalaicus*, Rothschild, Nov. Zool. v. p. 602 (1898).

*Teinopalpus imperialis*, Elwes, Trans. Ent. Soc. Lond. 1888, p. 421. Leech, Butt. of China, ii. p. 509 (1893).

IMAGO.—Male. Upperside similar to *T. imperialis*. “Does not always differ from Assam specimens, but the orange-yellow area of the hindwing is mostly wider in front, especially on the underside, and the black lunules at the outer side of this area are thinner below.”

Female. Upperside similar to *T. imperialis*. “The grey discal area of the hindwings generally paler than in the Khasia Hills individuals, posteriorly more extended yellow; discal black lunules  $R^3$ — $M^2$  thinner. On the underside the yellow colour reaches from abdominal margin to beyond  $M^1$ ; there are few black scales between  $M^1$  and  $M^3$ ; middle of disc much less shaded with black scaling than in Assam form of *imperialis*, the black outer border of the discal area thin; in the Assam specimens the bars composing that border are generally heavy, the discal area is more or less shaded black, often all black from  $R^2$  down to abdominal margin.”

Expanse, ♂  $3\frac{8}{10}$ , ♀  $4\frac{6}{10}$  inches.

HABITAT.—Nepal; Sikkim; Bhotan; C. China.

DISTRIBUTION AND HABITS.—The type male was taken by Mr. Otto Müller, in Sikkim, in April, and the type female by Dr. F. G. Pilcher, in Bhotan, in May. Both are in the Collection of Mr. W. Rothschild. Specimens were taken by General G. Ramsay “on the peak of Nag Arjaon Mountain, western end of Valley of Nepal” (MS. Notes). Mr. H. J. Elwes says: “This splendid insect is peculiar to Sikkim, and is found only in the forest region from about 6000 to 10,000 feet elevation. Unless its habits are known, it is most difficult to capture, on account of its remarkably strong, rapid, and darting flight, and its habit of resting on high trees, from which it flies only during a few hours of the morning, during the rare intervals of sunshine which prevail in these cloudy, damp, and rainy forests. The female,

which seldom or never flies in the same places as the males, is so extremely rare that, though for many years high rewards have been offered for it to the natives who make a business of catching insects, only six or seven in all are known to have been taken, and these mostly by chance in places outside the forest. In order to take the male, one must go early in the morning in the months of June, July, or August, to one of the few spots in the neighbourhood of Darjiling, where a little cleared space is found on the summit of a mountain-top. Birch Hill, Sinchul, and Tonglo are all suitable places; but the top of Sinchul, called Tiger Hill, which is over 8000 feet elevation, is the best, as it is surrounded by a large tract of virgin forest. If the morning is bright and sunny, about eight o'clock one may expect to see *Teinopalpus* flying round the tops of the trees, and occasionally settling, but usually out of reach. The natives lay baits of some evil-smelling nature to attract the insect, and with patience and the skilful use of a long-handled net sometimes succeed in taking two or three in a morning in this manner. The insects are so strong and active in the net, however, that they are difficult to get in a perfect state, and always command a high price, even at Darjiling. The flight is usually over by 11 a.m., even if the morning continues fine, which is very rarely the case during the rainy season. I have seen and taken *Teinopalpus* as high as 10,500 feet, on the top of Tonglo, and also at Tendong and Rikisum, and I believe it occurs as far eastward as Buxa. The pupa has been found by Mr. Knyvett attached to the leaves of *Daphne nivalensis*, a plant which is used for making a fine, strong paper in Nepal, and a female has been bred by him from one of these pupæ. This plant is probably the food-plant of the larva, and grows at 7000 to 9000 feet in the virgin forests where the insect occurs" (Tr. Ent. Soc. 1888, 421). Mr. L. de Nicéville states that it is found in Sikkim, flying from April to August" (Sikk. Gaz. 1894, 170). Mr. J. H. Leech records "two males taken at Chang Yang, Central China" (*l.c.* 510).

Our illustrations of *T. Himalaicus* on Plate 415 are taken from the type specimens kindly lent for this purpose by Mr. Rothschild.

**TEINOPALPUS IMPERATRIX** (Plate 416, fig. 1, 1a, ♂ ♀).

*Teinopalpus imperatrix*, de Nicéville, Journ. Bombay Nat. Hist. Soc. 1899, p. 335, pl. BB, ♂ ♀.

IMAGO.—"Differs from *T. imperialis* in the following particulars. Upperside. *Forewing* darker green, the black ground-colour showing through the green scales more prominently. *Hindwing* with the rich chrome-yellow discal fascia with its inner edge not encroaching on the discoidal cell, instead of reaching well into it, that portion of the fascia in the second subcostal interspace considerably longer; all the tooth-like projections on the outer margins much longer, especially those at the terminations of the second subcostal and first median nervules. Underside.

*Forewing* with the five black fasciæ crossing the wing much broader, especially the middle one. *Hindwing* with the discal yellow fascia broader."

"Female. Considerably larger than that sex of *imperialis*. Upperside. Both wings much darker; all the black coloration much more prominent. *Hindwing* with the pale violet black-irrorated discal area of *imperialis* almost entirely replaced by a black suffused area, the black line closing the cell entirely obliterated; the chrome-yellow subanal area at least twice as broad, the outer-discal lunulated black fascia consequently placed much nearer to the outer margin; all the tails very much longer. Underside. Both wings with much the same difference as on the upperside."

Expanse ♂  $4\frac{6}{10}$ , ♀  $5\frac{6}{10}$  inches.

HABITAT.—Upper Tenasserim, Burma.

DISTRIBUTION.—The type specimens were obtained in the Tounghoo Hills, at 4000 feet elevation, Upper Tenasserim, Burma, in January and March, by Mr. T. A. Hauxwell. Of these a male and female is in the Collection of Mr. W. Rothschild, and in that of Mr. H. Grose-Smith.

### Sub-family LEPTOCIRCINÆ.

*Leptocircina*, Kirby, Allen's Nat. Hist. Butt. ii. p. 307 (1896). Watson, Proc. Manchester Lit. and Phil. Soc. 1899, p. 4.

#### CHARACTERS OF THE LEPTOCIRCINÆ.

IMAGO.—Wings small. *Forewing* triangular; median and submedian veins connected by a very slender cross-veinlet near the base. *Hindwing* short, much produced posteriorly, folded longitudinally in the middle, and with a very lengthened slender tail from the upper median veinlet; abdominal margin long, and, in the male of *L. Curius*, grooved near the base and there furnished with a radiating tuft of white androconial hairs; precostal veinlet long, curved; interno-basal costal cell distinct; discoidal cell very short and narrow. *Body* stout; head large and broad; palpi very short, clothed with long loose scales; antennæ rather long, club short and compressed; legs rather long, slender; anterior tibia with a stout lateral spur; tarsi long, the terminal claws of both sexes simple in *L. Meges*, and bifid in *L. Curius*.

#### Genus LEPTOCIRCUS.

*Leptocircus*, Swainson, Zool. Illust. Ins. ii. pl. 106 (1833). Boisduval, Spec. Gén. Lep. i. p. 380 (1836). Doubleday and Hewitson, Gen. D. Lep. i. p. 22 (1847). Felder, Verh. Z. B. Ges. Wien. 1864, pp. 289, 331. Wallace, Trans. Linn. Soc. xxv. p. 68 (1865). Staudinger and Schatz, Exot. Lep. ii. p. 47, pl. 2 (1892). Distant, Rhop. Malayana, p. 365 (1886). Leech, Butt. of China, etc., ii. p. 507 (1893). Kirby, Allen's Nat. Hist. Butt. ii. p. 307 (1896).



*Lamprosur*a, Boisduval, MS.

*Lamproptera*,\* Gray, Griffith's Ed. Cuv. An. Kingd. xv. pl. 102, fig. 4 (1832).

IMAGO.—Wings small. *Forewing* triangular, the anterior and exterior margin nearly equal in length, the posterior margin about half the length of anterior, apex obtuse; first subcostal veinlet emitted at fully two-thirds before end of the cell, second at one-sixth before the end, third and fourth at fully one-third beyond the end of the cell, fifth from a short distance beyond end of the cell below the latter; cell extending to about half length of the wing; upper and middle discocellular inwardly oblique, the upper longest, upper radial from their angle, lower discocellular positioned so that the lower radial appears as it were a fourth median branch; the median and submedian vein with a very slender short cross-veinlet near their base; submedian vein much recurved from the base and with a lower basal lengthened slender veinlet extending to the posterior margin. *Hindwing* short, much prolonged posteriorly, anterior margin straight, the base much lobed, exterior margin scalloped anteriorly and sinuous posteriorly, the middle being gradually produced into a very long slender tail, the anal angle pointed; abdominal margin long, fringed with fine hairs, and in the male of *L. Curius* grooved near the base along the submedian, and there furnished with a radiating tuft of white androconial hairs; † precostal veinlet long, very slender, curved; interno-basal costal cell distinct; discoidal cell very short and narrow; second subcostal veinlet emitted at one-half before upper end of the cell; discocellulars extending very obliquely outward, slightly bent, the radial from their angle; middle and lower median veinlet emitted from near end of the cell, the upper median extending to end of the tail; submedian vein long. *Body* stout; head large, front broad and hairy; eyes prominent; palpi very short, clothed with long loose scales; antennæ rather long, slender, the club short and compressed. *Legs* rather long, slender; anterior tibia with a stout lateral spur covered with scales; tarsi longer than the tibiæ and laterally spined, the first joint equal in length to the others combined; claws simple in both sexes of *L. Meges*, bifid in *L. Curius*.

LARVA.—According to a figure, kindly drawn for us from memory, by Col. C. T. Bingham, who found and reared it in Burma, the larva is very much like that of the genus *Thais*.

TYPE.—*L. Meges*.

HABITS OF IMAGO.—The species of *Leptocircus*, according to the observations of Mr. A. R. Wallace (*l.c.*) “frequent water, often settling on the edges of rills, or

\* *Lampropteryx*, used in 1829 for a genus of Lepidoptera.

† This tuft of hairs has only been observed in the males of the *white-banded* species. In the numerous males of the *green-banded* species that we have examined this tuft has not been detected.

hovering over pools and rivulets in the sunshine." Mr. S. B. J. Skertchly (Ann. N. H. 1889, 217) says, "I have only seen it, in N. Borneo, on streams and rivers in rocky places well open to sunshine. It is an exceedingly swift flyer, darting with rapidly vibrating wings from point to point, dashing backwards and forwards over a particular patch of sand like a dragon-fly, and making considerable journeys in the day. Like many other butterflies, it is methodical, frequenting the same places at the same hour; so that when once seen, I could always find it again. It is an early riser, and may be caught drinking before nine o'clock. It delights in hot sunshine, and is comparatively sluggish on dull days. When drinking it has a most remarkable habit of ejecting the water from behind. Pushing its proboscis into the wet sand, it takes long steady drinks, and pumps the water out astern in rhythmic squirts, forming quite a little stream. It can project the water full three inches. At such times it can be approached closely if no sudden movement is made. It does not always pump, and I have often watched for it in vain." Mr. J. J. Walker, R.N. (Tr. Ent. Soc. Lond. 1895, 472) writing of the white-banded *Leptocircus* found in Hongkong, remarks that it is "met with in February, March, and April. It is hardly possible to imagine a more dainty and elegant little creature, as it feeds at the white blossoms of its favourite shrub, *Buddlea asiatica*, probing flower after flower of the racemes with its proboscis, with the long tails of the hindwings elevated and quivering, and vibrating its wings all the time without actually settling, like its larger relatives, the Papilios. When alarmed it booms off rapidly, with a flight resembling that of the larger Hesperiidæ. I have never seen it hovering over running water in the manner described by Mr. H. O. Forbes, although there is a fine stream in the gardens where they were taken."

**LEPTOCIRCUS CURIUS** (Plate 417, fig. 1, ♂, 1a, b, ♀).

*Papilio Curius*, Fabricius, Mant. Ins. ii. p. 9 (1787); Ent. Syst. iii. p. 28 (1793). Donovan, Ins. India, pl. 47, fig. 1 (1800).

*Leptocircus Curius*, Doubleday, Zoologist, 1843, p. 111, fig.; *id.* Gen. D. Lep. i. p. 23, pl. 4\*, fig. 1 ♂, (1847). Moore, Catal. Lep. Mus. E. I. Company, i. p. 85 (1857). Felder, Spéc. Lep. Pap. p. 1 (1864). Butler, Catal. Fabr. Lep. Brit. Mus. p. 159 (1869). Distant, Rhop. Malay. p. 366, pl. 42, fig. 1 (1886). Ponjade, Nouv. Archiv. du Mus. 3rd ser. iii. p. 257 (1891). Swinhoe, Trans. Ent. Soc. Lond. 1893, p. 315. Leech, Batt. of China, ii. p. 509 (1893).

IMAGO.—Male and female. Upperside black. *Forewing* with a transverse inner-discal silky-white semi-hyaline band, which is intersected only within its outer edge by the black veins; beyond is an outer-discal broad hyaline band which is narrowed at both ends, and is entirely intersected by the black veins, this band being widest in the female. Cilia black. *Hindwing* with a transverse upper-discal narrow pure white band; the lower-discal area tinged with rufescent-brown, the anal and

caudal area sparsely speckled with white scales; abdominal margin in the *male* grooved along the base of submedian vein and there furnished with a radiating tuft of androconial pure white hairs; cilia extending from the upper median to near end of the tail, and the entire tip of tail pure white, the cilia from anal angle being white only at the angles. Underside black. *Forewing* with the two bands as on upperside, the basal area being clothed with greyish-white hairs, and the posterior margin to the inner band with silky-white scales. *Hindwing* with the transverse white band, as on upperside, but bent inward from its lower end and continued less prominently in a zigzag line to the abdominal margin, below which portion are two short zigzag white streaks, and on the upper submarginal area is a similar white streak; basal area thickly clothed with greyish-white hairs and white scales. *Body* above, palpi, and legs above, black; abdomen beneath ochreous-white; head, thorax, and legs beneath greyish-white; tarsal claws in both sexes bifid.

Expanse,  $1\frac{4}{10}$  to  $1\frac{6}{10}$  inches.

HABITAT.—E. Bengal; Burma; Tenasserim; Malay Peninsula; Siam; W. and C. China.

DISTRIBUTION.—The Fabrician type specimen, in the Banksian Cabinet at the British Museum, is recorded from Siam. Mons. G. A. Poujade (*l.c.*) records it from the “banks of the Mekong from Pnom-Peng to Lom-bor, Siam.” Mr. W. Doherty (Pr. Zool. Soc. 1891, 251) found it “very common in Assam, ranging up to 6000 feet. Specimens were taken on the Dibong, north of Sadiya, this probably being the northern limit of the genus.” Col. C. Swinhoe has received several specimens from the “Khasia Hills, E. Bengal” (Tr. Ent. Soc. 1893, 315). Mr. W. S. Atkinson obtained it at Cherra Punji, Assam. Col. C. H. E. Adamson obtained it at Bhamo, Upper Burmah, being much less common than *L. Mege*s” (List, 1897, 50). Specimens from the Meple Valley, Burma, taken in October by Col. C. T. Bingham, and from Beeling, Upper Tenasserim, taken in March by Capt. E. Y. Watson, are in the British Museum. Mr. W. S. Distant records it from “Malacca and Perak” (*l.c.* 366). Col. Swinhoe has examples from Perak, Malay Peninsula. Mr. J. H. Leech's Collection contains examples from C. and W. China.

Specimens which we have examined from Sumatra and Borneo, and referred to by authors as *L. Curius*, have a narrower white discal band on both wings, and also a narrower hyaline band on the forewing. These are, doubtless, referable to *L. Libelluloides*. We have not seen authenticated Java specimens of *Curius*. There is an example in the British Museum, from the E. India Company's Collection, labelled “Java,” which was purchased from a dealer, but the locality of which is doubtful. This latter specimen is similar to the Sumatra form. It is recorded from Java by Fruhstorfer (Berl. Ent. Zeit. 1896, 306).

**LEPTOCIRCUS MEGES** (Plate 417, fig. 2, ♂, 2a, b, ♀).

- Papilio Meges*, Zinken-Sommer, Nova Acta Acad. Nat. Cur. xv. p. 161, pl. 15, fig. 8 (1831).  
*Leptocircus Meges*, Doubleday, Zoologist, 1843, p. 111, fig. ; *id.* Gen. D. Lep. i. p. 23 (1847). Moore, Catal. Lep. Mus. E. I. Company, i. p. 85 (1857), Wallace, Trans. Linn. Soc. xxv. p. 68 (1865). Distant, Rhop. Malayana, p. 365, pl. 32, fig. 3 (1886). Kirby, Allen's Nat. Hist. Butt. ii. p. 308, pl. 63, fig. 2 (1896).  
*Leptocircus Curius*, Swainson, Zool. Illust. Ins. ii. pl. 106 (1833). Boisduval, Spec. Gén. Lep. i. p. 381, pl. 7, fig. 1, ♀, pl. 17, fig. 3, ♂ (1836). Blanchard, Hist. Nat. Ins. iii. p. 422, pl. 2, fig. 2 (1840).  
*Iphielides Curius*, Hübner, Zutr. Exot. Schmett. figs. 645-6 (1832).  
*Erycina (Lamproptera) Curius*, Gray, Griffith's Ed. Cuv. An. Kingd. xv. pl. 102, fig. 4 (1832).  
*Leptocircus virescens*, Butler, Catal. Fabr. Lep. B. M. p. 259 (1869).

IMAGO.—Male and female. Upperside similar to *L. Curius*, the inner discal transverse band on the *forewing*, and the band on the *hindwing* broader, opaque, and of a pale green colour ; the hyaline band on the forewing also broader, especially in the female ; tails longest in the female. The tuft of androconial hairs, present in males of *L. Curius*, have not been observed in the numerous males of *L. Meges* examined. Tarsal claws in both sexes simple.

Expanse,  $1\frac{7}{10}$  to  $1\frac{9}{10}$  inch.

HABITAT.—Burma ; Tenasserim ; Malay Peninsula ; Sumatra ; Java.

DISTRIBUTION.—Col. C. H. E. Adamson records it as being “found in suitable places at a slight elevation, throughout Burma, during the rains and in the cold weather” (List. 1897, 50). We possess specimens from Moulmain, Tounghoo, Salween Valley. Signor L. Fea obtained it in the Karen Hills in May and November. Col. C. Swinhoe has examples from Palene, taken in June by Mr. Noble, and Donat Range taken in January. Mr. F. D. Godman has it from E. Pegu, taken by Mr. W. Doherty, and from Tavoy, Tenasserim. Mr. H. J. Elwes notes “several specimens taken in Tavoy and Ponselkai” (J. As. Soc. Beng. 1887, 438). Dr. J. Anderson obtained it on “Sullivan Island, Mergui Archipelago, in January” (Journ. Linn. Soc. Zool. 1886, 52). Mr. W. L. Distant records it from “Perak, Malacca, and Sungei Ujong, Malay Peninsula” (*l.c.*). Col. Swinhoe has specimens from Perak. We possess it from Sumatra and Java, the latter taken by Dr. Horsfield. Dr. L. Martin says that it “occurs, in Sumatra, throughout the year in the plains and on the outer hills” (J. As. Soc. Bengal, 1895, 529). The type specimen is recorded by Zinken-Sommer from Java.

HABITS.—Capt. Godfrey writes : “In Perak I invariably found this butterfly over running water, and its appearance was so peculiar that, had I not known what to expect, I might almost have passed it by, thinking it was not one. The transparent wings and long streaming tails gave it a certain resemblance to a

dragon-fly, and since its haunts are by the water-side, this may be of service to the insect. Its flight, however, hardly bears out this resemblance, consisting of a kind of dancing motion—a series of mid-air jumps, so to speak—very different to the direct swift flight or the steady hovering motion of the *Libellulidæ*. Still, the rapid vibration of its transparent wings strongly reminded me of the dragon-fly, and it is possible that it sometimes hovers in its flight, after the manner of the latter, though I did not see it do so” (Distant, Rhop. Malay. p. 365). Mr. H. O. Forbes has published similar observations, made in Sumatra: “By the margin of a small stream I caught *Lep. virescens*, which derives protection from mimicking the habits and appearance of a dragon-fly, in a crowd of which it is often to be found. In form it reminded me of the European genus *Nemoptera*. It flits over the top of the water, fluttering its tails, jerking up and down just as dragon-flies do when flicking the water with the tip of their abdomen. When it settles on the ground it is difficult to see, as it vibrates in constant motion its tails and wings, so that a mere haze, as it were, exists where it rests.” (Nat. Wand. East. Archipel. p. 139.) Dr. L. Martin says: “Both species of *Leptocircus*, found in Sumatra, are fond of running water, and fly very low over open grassy places on river banks; they often settle on wet sand, but never on the grass. When flying they make constantly a strange vibrating motion with the hindwings, which adds to their strong resemblance to dragon-flies.” (J. As. Soc. Bengal, 1895, 529.)

INDO-MALAYAN SPECIES.—*Leptocircus Libelluloides*, Frubstorfer, Berl. Ent. Zeit. 1898, p. 179. *Syn.* *L. Curius*, Kheil, Rhop. Nias, p. 37 (1884). *Habitat.*—Nias, Sumatra; Sarawak, Borneo (?); Java.—*Leptocircus Walkeri*. Male and female. *Forewing* with the inner-discal semi-transparent white band conspicuously broader than in typical *L. Curius*. *Hindwing* with the white band also somewhat broader than in *Curius*. *Habitat.* Hongkong (Types in Coll. British Museum).—*Leptocircus Decius*, Felder, Wien. Entom. Monats. vi. p. 234 (1862); *id.* Reise Nov. Lep. i. p. 1, pl. 21, fig. b (1865). *Syn.* *L. Wilsoni*, Reakirt, Proc. Ent. Soc. Philadelphia, 1864, p. 495. *L. Corion*, Gray, MS. List. Lep. B. M. p. 86 (1856). *Habitat.* Philippines. *Leptocircus Curtius*, Wallace, Trans. Linn. Soc. Lond. xxv. p. 63 (1865). *Syn.* *L. Ennius*, Felder, Reise, Nov. Lep. i. p. 2, pl. 21, fig. a (1865). *Habitat.* Celebes.

### Sub-family PAPILIONINÆ.

*Papilionina*, Swainson, Cabinet Cyclop. p. 87 (1840). Bates, Journ. of Entom. ii. p. 177 (1864). Moore, Lep. of Ceylon, i. p. 141 (1881). Marshall and de Nicéville, Butt. of India, i. p. 18 (1882). Distant, Rhop. Malaya, p. 321 (1885). Doherty, Journ. As. Soc. Bengal, 1886, p. 136. Scudder, Butt. U.S. ii. p. 1219 (1889). Tutt, Brit. Butt. pp. 86, 216 (1896). Jordan, Nov. Zool. v. p. 383 (1898).

*Papilionina*, Swainson, Phil. Mag. 1827, p. 188. Herr. Schæffer, Lep. Exot. p. 53 (1858).

- Papilionidi*, Stephens, Catal. Brit. Lep. B. M. p. 1 (1850). Stainton, Manual Brit. Lep. i. pp. 12, 14 (1857).  
*Papilionides*, Kirby, Eur. Butt. p. 2 (1863).  
*Equites*, Wallengren, Lep. Scand. pp. 5, 170 (1853), Scudder, Syst. Revis. Amer. Butt. p. 43 (1872).  
*Equitinae*, Kirby, Allen's Nat. Hist. Butt. ii. p. 249 (1896).  
*Papilioninae* (Tribe *Troides*), Rippon, Icones Ornith. i. p. 9 (1900).

#### CHARACTERS OF THE PAPILIONINÆ.

IMAGO.—*Forewing* subtriangular or triangular, rarely elongate, falcate, or rounded; subcostal vein five-branched; cell extending to fully half the wing, always closed; lower discocellular veinlet appearing as a fourth branch of the median vein; median and submedian vein connected near the base by a short cross veinlet; submedian with a lower short basal branch extending towards the posterior margin. *Hindwing* triangular or rounded, sometimes gradually prolonged posteriorly into a broad or slender tail, more often the exterior margin is rounded and more or less scalloped or dentated; abdominal margin excised, never channelled for the reception of the abdomen; in the males of some, the abdominal margin is folded over on to the upper surface, and there covers an elongated androconial tuft of hairs; costal vein emitted upward from the base; precostal veinlet and an interno-basal costal cell always present; internal vein absent. *Body* rather stout; abdomen elongated; head large; palpi short, scaled or hairy; antennæ generally rather long, club elongated, curved; legs generally long, powerful, all perfect in both sexes, tarsal claws simple and without appendages, anterior tibiæ with a stout lateral spur about the middle.

EGG.—Dome-shaped, flattened at the base, slightly rugose.

LARVA.—Stout, sub-cylindrical or cylindrical; either furnished with rows of fleshy tubercles or smooth or granulated, sometimes humped towards the head; prothoracic segment furnished with a forked or two retractile tentacles, or osmateria, which are concealed during repose, but are extended when the animal is irritated, and then exhale a strong aromatic scent.

PUPA.—Attached by the tail, generally in an upright position, and secured by a silken girth round the middle of the body; head bifid, square, or subtruncate.

#### Genus ORNITHOPTERA.

- Troides* (part), Hübner, Verz. bek. Schmett. p. 88 (1816). Rothschild, Nov. Zool. ii. p. 183 (1895).  
*Ornithoptera*, Boisduval, Voy. Astr. p. 33 (1832); *id.* Spec. Gén. Lep. i. p. 173 (1836). Moore, Lep. of Ceylon, i. p. 154 (1881). Kirby, Allen's Nat. Hist. Butt. ii. p. 263 (1891). Staudinger and Schätz, Exot. Schmett. ii. p. 40 (1886).

*Ornithoptera* (part), Westwood, Int. Ent. ii. p. 348 (1840). Doubleday and Hewitson, Gen. D. Lep. i. p. 3 (1846). Wallace, Trans. Linn. Soc. xxv. p. 35 (1865). Distant, Rhop. Malayana, p. 325 (1885).

*Amphrisius*, Swainson, Zool. Illust. ii. p. 98 (1833).

*Aërnauta* (part), Berge, Schmett. p. 19 (1842).

*Pachlioptera* (part), Reakirt, Proc. Ent. Soc. Philadelphia, iii. p. 503 (1864).

*Papilio* (sect. 2), Felder, Verh. Z. B. Ges. Wien. 1864, p. 290.

*Pompeoptera*, Rippon, Icones Ornith. i. p. 4 (1890), *id.* ii. p. 7 (1896).

IMAGO.—Male. *Forewing* large, elongated, triangular; costa slightly arched, apex rounded, exterior margin very oblique, and more or less waved, posterior margin short and very slightly recurved; costal vein extending to fully three-fourths the margin; first subcostal branch emitted at one-half and second at one-fourth before end of the cell, third from the end or at a very short distance beyond end of the cell and terminating at the apex, fifth at about one-third beyond the cell from below the fourth; the cell extending to beyond half the wing, the false-veins or longitudinal folds within the cell fairly distinct; discocellulars outwardly-oblique, upper shortest and straight, lower concave, the upper radial from their angle; the fourth or upper median branch from lower end of the cell, third median at about one-seventh, the second at one-third, and first at one-half before end of the cell; median and submedian vein connected by a short transverse veinlet near the base; submedian vein with a short subbasal lower veinlet extending obliquely outward to the posterior margin. *Hindwing* short, small in proportion to the forewing, subtriangular; anterior margin slightly arched; exterior margin rounded and scalloped; abdominal margin, *in the male*, with a *longitudinal fold or pouch* extending along the submedian vein, and, when opened, *disclosing a densely-packed mass of downy androconial hairs*, occupying the area between the submedian and the extreme margin, this pouch being usually closed or only traced by a pale line down the submedian vein; precostal vein two-branched, the inner branch curved, the outer branch uniting with the costal vein and thus forming an interno-basal costal cell; upper discocellular outwardly-oblique, second short, the radial from their angle; middle median branch at about one-fifth and lower at one-third before end of the cell; submedian vein recurved; abdominal marginal hairs long. *Head* and eyes large; thorax very stout, woolly; abdomen long, stout, compactly scaled; males furnished with two large anal valves; palpi small, hairy, pressed to the head; legs long, strong, fore tibia with a very stout lateral spur about the middle; tarsal claws simple; antennæ very long, gradually clavate, the club slightly tapering towards the apex, and slightly curved.

LARVA.—Cylindrical, with two dorsal rows, and anterior and lateral rows of fleshy tubercles; a retractile pair of tentacula (osmateria) situated behind the head.

PUPA.—Stout; arched backward anteriorly; thorax conical, the top flattened

and its sides angled; wing-cases dilated and flattened laterally in the middle, their outer edge acute; middle segments of abdomen with a dorsal pair of conical prominences. Attached by the tail, and a silken thread round base of thorax.

TYPE.—O. Helena.

HABITS OF IMAGO.—“All *Troides* are true inhabitants of the forest, but the yellow species (*Pompeoptera*) in both sexes are very fond of flowers, *Hibiscus*, *Ixora*, and *Poinciana pulcherrima*, and so approach houses and are seen in the gardens, but they never settle on roads. *Trogonoptera Brookiana*, on the contrary, never settles on flowers, but only on damp spots on roads and also near houses on manure heaps and kitchen middens. All of them were very appropriately named, generically, *Ornithoptera* by Boisduval, as, on the wing, they really look very much like birds, especially *T. Brookiana*, which, when sailing high over a road or in the forest, has a most striking resemblance to the small and common Swift of the tropics. Usually they fly slowly, but if pursued their flight becomes extremely rapid, so that they are soon borne out of reach and sight. They never entirely settle on flowers, but seize them with their forelegs, they float above the flower by gently moving their wings for a few seconds, when they seek another. They are strong fliers, as the females in especial have to make long journeys to find the rare food-plant; when so flying they keep high up in the air, doubtless to overlook a large stretch of jungle. All *Troides* are early risers, and are already out at 7 o'clock in the morning; in the hottest hours of the day they are rarely seen, but appear late in the evening at 5 or 6 o'clock, when, with the exception of some *Satyrinæ*, *Amathusiinæ* and *Hesperiidæ*, all other butterflies have gone to rest long ago.” (Dr. L. Martin and L. de Nicéville, Butt. of Sumatra, J. As. Soc. Bengal, 1895, 509).

Col. C. H. E. Adamson, in his “List of Burmese butterflies,” says that “*Rhadamanthus* [*Æacus*] is most abundant from June to September, and, what was evidently a fresh brood, was seen flying in February.”

**ORNITHOPTERA DARSIVS** (Plate 418, fig. 1, larva and pupa; 1a, b, ♂ ♀).

*Ornithoptera Darsivus*, Gray, Catal. Lep. Ins. Brit. Mus. pt. i. p. 5 (1852). Moore, Catal. Lep. Mus.

E. I. Company, i. p. 87, pl. 2, fig. 2, 2a, larva and pupa (1857). Felder, Wien. Entom. Monats. iv.

p. 9 (1860). Moore, Lep. of Ceylon, i. p. 155, pl. 55, fig. 1, 1a, b, ♂ ♀, larva and pupa (1881).

*Troides Darsivus*, Rothschild, Nov. Zool. ii. p. 203 (1895).

*Ornithoptera Amphimedon*, Doubleday and Hewitson, Gen. D. Lep. i. pl. 1, fig. 2, ♂ (*nec Cram.*).

IMAGO.—Male. Upperside. *Forewing* rich black; in some specimens the borders of the outer veins are slightly paler than the ground colour. *Hindwing* with the basal area across half or two-thirds the cell, the abdominal border, and a broad outer marginal sinuous inner-edged band rich purplish-black, the end of the



cell and the discal area being rich golden-yellow or paler olivescens-yellow, crossed by broad black veins, and in some specimens bearing a small black subanal and a costal spot, or more rarely a row of four spots; base of cell and submedian area thickly clothed with very fine long black hairs. Cilia of both wings alternated with white. Underside. *Forewing* duller black; the outer veins and end of cell more or less slightly bordered with bluish-grey streaks. *Hindwing* as on upperside; the abdominal margin brown.

Female. Upperside paler. *Forewing* dark olivescens brownish-black, with the outer veins and end of the cell longitudinally bordered with dusky olivescens-grey scales. *Hindwing* with broad black basal area and outer marginal band, the discal area olivescens-yellow crossed by broad black veins and an outer curved confluent row of large ovate spots, which latter partly coalesce with the marginal band, the intervening submarginal yellow spaces being thus more or less obliterated; the discal space between the lower median and submedian vein dusky-grey. Cilia of both wings alternated with white between the veins. Underside. *Forewing* duller black, the vein streaks more defined and bluish-grey. *Hindwing* as on upperside.

*Thorax*, head, antennæ and legs black; abdomen above olivescens brownish-black, and in the male with slender yellow segmental bands, sides and beneath yellow, with a lateral row of black segmental spots in the male, and bands in the female; collar, and sides of thorax beneath crimson.

Expanse, ♂  $5\frac{1}{2}$  to 6, ♀  $6\frac{1}{2}$  to 7 inches.

LARVA.—Cylindrical; dull purple-brown, with two dorsal rows, and anterior and lateral rows of fleshy tubercles, those on the eighth segment and a streak from its base to lower end of seventh segment being pale pink; between the tubercles are dark brown streaks. Feeds on *Aristolochia*.

PUPA.—Pale purplish-ochreous; bent backward anteriorly; thorax conical, the top flattened and its sides angled; wing-cases dilated and flattened laterally in the middle, their outer edge acute; two middle segments of abdomen with a dorsal pair of conical prominences.

HABITAT.—Ceylon.

DISTRIBUTION AND HABITS.—“This very fine insect is not uncommon in Ceylon in open woods, and may often be seen flying in pairs;—a female in the first place rising slowly and nearly vertically into the air, and then followed, at a short interval in the same direction and with the same style of flight, by a male, the two keeping about two or three feet apart, rising and falling in the air in perfect unison, as if for a period under the influence of a spell or of a kind of animal magnetism. The phenomenon recalls to mind the flying of two paper kites one above the other; both attached by a common string held in the hand, so simultaneously do the insects move together whilst keeping at the same distance apart. Sometimes a second or

even a third male finds itself drawn under the same influence, and constrained, as it would seem, to follow the same mysterious leading under a similar sexual excitement or exaltation" (Dr. Thwaites, MS. Notes). Capt. Hutchison obtained it in the "Western, Central, and Southern Provinces; plains and hills, in forest and open ground, all the year." Capt. Wade found it very common in Kandy. Mr. F. M. Mackwood says it is "abundant in the low country, and the hills up to about 4000 feet. It is on the wing all the year round, but March and April are the months when they emerge from the chrysalis" (Lep. Ceylon, i. 155). "Few insects can compare with this species in beauty, as it hovers over the flowers of the Heliotrope, which furnish the favourite food of the butterfly. The larva feeds on the *Aristolochia* and the *Betel* leaf, and suspends its chrysalis from its drooping tendrils" (Sir J. Tennent, N. H. Ceylon, 425).

**ORNITHOPTERA MINOS** (Plate 419, fig. 1, larva and pupa; 1a, b, ♂ ♀).

- Papilio Eques Trojannus Minos*, Cramer, Pap. Exot. iii. p. 4, pl. 195, fig. a, ♀ (1779). Jablonsky and Herbst, Nat. Schmett. i. p. 206, pl. 4, fig. 2 (1782). Esper, Ausl. Schmett, p. 127, pl. 32, fig. 1 (1792).
- Troides Minos*, Hübner, Verz. bek. Schmett. p. 88 (1816). Rothschild, Nov. Zool. ii. p. 203 (1895).
- Papilio Minos*, Felder, Verh. Z. B. Ges. Wien. 1864, pp. 291, 334.
- Ornithoptera Pompeus*, var. *Minos*, Wood-Mason, Journ. As. Soc. Bengal, 1881, p. 86.
- Ornithoptera Minos*, Staudinger, Exot. Schmett. i. p. 5 (1884). Aitken, Journ. Bombay, N. H. Soc. 1887, p. 35. Davidson and Aitken, *id.* 1890, p. 361 (*larva*), *id.* 1896, p. 376.
- Papilio (Ornithoptera) Minos*, Hampson, Journ. As. Soc. Bengal, 1888, p. 363. Ferguson, J. Bombay N. H. Soc. 1891, p. 445.

IMAGO.—Male. Upperside. *Forewing* rich black, the outer veins from the lower median upward more or less slightly bordered with grey-scaled streaks, these scales at the base of the lower median being mostly yellow; the end and lower edge within the cell also slightly streaked with grey scales. *Hindwing* dark or pale golden-yellow; with a black band extending across extreme base of the cell, along the anterior margin and curving from below the costal vein to one-third of the subcostal, from whence it is conically continued along the outer margin to near the lower median, and thence broadly up the abdominal margin; the two lower or subanal conical portions of the outer marginal band are generally inwardly-edged more or less with blackish scales, these scales being more apparent in the pale yellow discal specimens; veins across the disc black lined. Cilia of both wings slightly alternated with white. Underside. *Forewing* duller black; the veins and the cell bordered with well-defined grey streaks. *Hindwing* as on the upperside, except that the anal and two subanal cones of the marginal band have each two longitudinal short greenish-yellowish scaled streaks, and a similar scaled line

bordering the median to its base below the cell, some grey scales also are scattered near the middle of the submedian vein, and in some specimens there is a black small spot above the anal cone, and in others there is a coalesced larger spot above the anal cone and also a small spot in the next median interspace. Head and thorax, antennæ and legs black; collar and sides of thorax beneath crimson; abdomen above ochreous-yellow, beneath bright yellow with two lateral rows of black spots.

Female. Upperside. *Forewing* rich brownish-black; the outer veins and cell prominently bordered with sullied grey streaks. *Hindwing* with dark golden-yellow discal area; veins broadly black lined; the black base, costal border, outer marginal band and abdominal border broader than in male; the disc bearing a series of large black conical spots; middle of abdominal border generally speckled with grey scales, and the anal cones edged with similar scales. Cilia of both wings alternated with ochreous-white, that of the hindwings also inwardly edged with the same colour and thus forming a distinct lunule between the veins. Underside. *Forewing* dull black; cell and vein streaks more sharply defined and of either an ochreous-grey or bluish-grey tint. *Hindwing* with the discal area somewhat paler golden-yellow, the black borders and discal conical spots as on upperside; the anal and subanal cones, or the entire marginal series longitudinally bordered with pale ochreous-white, and in some specimens the discal series of cones are also more or less slenderly edged with the same colour. Head, thorax, antennæ and legs black; collar and sides of thorax beneath crimson; abdomen above brownish-ochreous, with a tuft of short black hairs on subanal segment; anal claspers whitish; abdomen beneath yellow, with two lateral rows of black segmental spots.

Expanse, ♂ 6 to  $6\frac{1}{2}$ , ♀ 6 to  $7\frac{1}{2}$  inches.

LARVA.—“Cylindrical, tapering a little at each end; furnished with two dorsal rows of fleshy processes, somewhat curved forwards, and a double row on each side of much shorter processes; the second, third, and fourth segments have each an additional long pair between the dorsal and lateral rows. Head smooth and black, the body of a uniform, dark, madder-brown, prettily lighted by a tinge of pink at the points of some of the fleshy processes. The dorsal processes on the eighth segment and a lateral pair on the seventh are pinkish-white, and are united by a band of the same colour” (Davidson and Aitken, *l.c.*).

PUPA.—“Suspended by the tail, and a girdle which encircles it much nearer the head than is usual in *Papilio* pupæ. In form it is stout, flattened and dilated in the middle, the head and thorax thrown back; head somewhat angular and tuberculated, and two of the abdominal segments bear each a prominent dorsal pair of pointed tubercles. Colour usually light brown, with a contrasting saddle of old gold, or sometimes of a withered green hue, with the saddle bright yellow. When touched

it makes a husky squeaking noise, produced apparently by friction of the abdominal rings" (Davidson and Aitken, *l.c.*).

EGG.—"Reddish colour, and under a strong lens looks very like a rough red orange" (D. and A. *l.c.* 361).

HABITAT.—South India.

DISTRIBUTION AND HABITS.—"This butterfly is very common in the N. Kanara District of Bombay, during the latter half of the Monsoon. By the end of the year it has become scarce, at least on the Coast, and many are not seen after that until the beginning of June, when the first rain brings them out in some numbers. It flies slowly, but often to a good height, and hovering much over flowers. They rest with the wings expanded. The larvæ are found in July, becoming increasingly common till October, and are always conspicuous by their colour, resting on the stems and under the leaves of the food-plant, *Aristolochia indica*, a creeper with bitter leaves. The larvæ are protected by an offensive smell, and doubtless taste similarly also both in the larval and perfect states. The egg, which we have often found, is of a reddish colour, and under a strong lens looks very like a rough red orange; it is hatched on the eighth day. The larva is a cannibal, and if not well supplied with fresh food will devour pupæ of its own kind. The pupæ state lasts nearly four weeks" (J. Davidson and E. H. Aitken, *l.c.* 1890, 361; 1896, 576-7). The late S. N. Ward, in his MS. Notes, writes: "This butterfly is found all over Malabar from the summit of the highest hills to the sea level. The larva is cylindrical, with a subdorsal row of obtuse nearly cylindrical processes, two rows of somewhat smaller processes occupying the middle, second, third, and fourth segments, a triple row at the bottom of each segment, and a black horny plate behind the neck beneath which the nuchal tentacles lie concealed. Colour dark purple, clouded and mottled with darker shades of the same, the tips of the processes being pale red, and with a flesh-coloured irregular-shaped band on each side extending diagonally backwards from the bottom of the sixth to the top of the seventh segment, the pink colour including the processes which rise from it. Pupa very light pinkish brown, minutely streaked all over with thin dark lines, the saddle golden yellow. Mr. E. L. Arnold says it is "found in the neighbourhood of Koonoor. It is a high flyer, and the moment has to be watched for when it comes sailing down in easy circles and alights upon some low-growing shrub, especially *Clematis Wightiana*, on which perhaps its larva feeds, though I have never succeeded in finding it here" (Ent. Mo. Mag. 1880, 137). Dr. F. Day found it in Cochin, appearing during October, and is seen from the early morning to the evening, as late as February or March" (MS. Notes). Capt. E. Y. Watson took "a single female at Kathlekan, Mysore, in November" (J. Bombay N. H. S. 1890, 8). Mr. H. S. Ferguson says it is "fairly common in the low country of Travancore, and up to

4000 feet on the Hills" (*id.* 1891, 445). Mr. Bourdillon obtained it in "Travancore, on the Kallaur road, 1200 feet, in February, and at Mynall, 1500 feet, in April" (MS. Note). Mr. G. F. Hampson records its capture on the "Nilgiris at 3000 to 7000 feet elevation" (J. As. Soc. Beng. 1888, 363). Mr. Sealy writes: "This insect occurs in tolerable abundance along the coast of South Malabar, Cochin, and Travancore. I have also observed it many miles inland, flying over the trees in the low jungle at the foot of the Western Ghauts, but I have not noticed it at any great height above the sea. In Cochin I have seen it from March to August, flying over the tops of the tallest Cocoa Palms, occasionally descending to hover over the flowers, especially those of the large scarlet *Hibiscus*, near which I have caught it in my own garden. The males seem less common than the females, and seldom were perfect on the wing. During last June and July I obtained many larvæ, they fed upon *Aristolochia indica*, and apparently upon it only. On July 19th, 1874, I obtained a large quantity both of the larvæ and pupæ. The larvæ I fed upon *Aristolochia*, and many changed to pupæ. From these many emerged before I left India on August 3rd, and others on board ship from the pupæ I took with me. They appear to remain about three weeks in pupæ. The pupa possesses the power of making a curious noise, like 'pha, pha,' and makes it very loudly when touched. The noise is accompanied (perhaps produced) by a sharp contraction of the abdominal segments. I thought at first it was merely produced by the rubbing of one ring of the pupa case against the next, but the sound did not resemble a mere frictional sound, it was more like the sound of the rush of air through small holes. The pupa sometimes contracted on being touched without making the noise, and appeared unable to make the noise until some time was given to allow it to recover its vigour" (Proc. Ent. Soc. 1875, p. ix.).

Of our illustrations on Plate 419, figures 1, larva and pupæ, are from Mr. S. N. Ward's drawings; and figs. 1a, b, from male and female.

**ORNITHOPTERA CERBERUS** (Plate 420, fig. 1, 1a, ♂, 1b, c, ♀).

*Papilio Cerberus*, Felder, Verh. Zool. Bot. Ges. Wien, 1864, p. 291; *id.* Reise Nov. Lep. i. p. 19 (1865).

*Ornithoptera Cerberus*, Staudinger, Exot. Schmett. i. p. 4, pl. 2, ♂ (1884). Swinhoe, Trans. Ent. Soc. Lond. 1893, p. 311.

*Troides Helena Cerberus* (part), Rothschild, Nov. Zool. ii. p. 219 (1895).

*Ornithoptera Pompeus*, Moore, Proc. Zool. Soc. Lond. 1865, p. 756. Wood-Mason and de Nicéville, Journ. As. Soc. Bengal, 1886, p. 373. Watson, Journ. Bombay N. H. Soc. 1888, p. 26. Elwes, Trans. Ent. Soc. Lond. 1888, p. 422. de Nicéville, Sikkim Gazetteer, 1894, p. 170.

*Pompeoptera Pompeus* (form *Cerberus*) part, Rippon, Mon. Ornith. ii. p. 55 (1895).

*Ornithoptera Hephaestus*, Distant, Rhop. Malayana, p. 328, pl. 27, figs. 2, 3, 4 ♂ ♀ (1885). Weymer, Stett. Ent. Zeit. 1885, p. 270. Hagen, Iris, vii. p. 18 (1894).

IMAGO.—Male. Upperside. *Forewing* rich or dull black; the medians and upper veinlets either very slightly paler bordered than the ground colour, or with the median veinlets slightly bordered basally with yellowish-grey scales. Cilia alternated with white between the veins. *Hindwing* golden-yellow, with black costal and abdominal border, and outer marginal continuous conical band, the anal portion of the latter being elongated and either constricted or broken in the middle, and in some there is also a very small inner spot in the lower median interspace; veins and cilia black. Underside similar to the upperside, except that in the forewing the vein streaks, when present, are more defined, and, in the hindwing, the abdominal margin is brown, the submedian interspace and anal lobes are speckled with green scales.

Female. Upperside. *Forewing* either dull or dark brownish-black, with the outer veins and end of the cell either slightly paler-edged than the ground colour, or prominently bordered by broad sullied-grey streaks. *Hindwing* golden-yellow, with broad black costal border, marginal continuous conical band, and a discal series of large conical spots; abdominal margin dark brown, and more or less grey speckled; veins black. Cilia of both wings alternated with white. Underside similar to the upperside.

Head and thorax above and beneath black; collar, and sides of thorax beneath crimson; abdomen above dark brown, with slender yellow segmental bands in the male; abdomen beneath and sides yellow, with a slightly apparent lateral row of black spots in male, and in the female a lateral and a lower row of distinct spots; anal valves of male white.

Expanse, ♂  $5\frac{1}{2}$  to 6, ♀  $6\frac{1}{2}$  to 7 inches.

HABITAT.—N. India; Burma; Tenasserim; Malay Peninsula; Sumatra; Nias.

DISTRIBUTION.—A single specimen is recorded as having been taken by Capt. Chaumette, "in a garden at Lucknow, Oudh, in August, 1860" (Capt. Lang, Ent. Mo. Mag. 1864, 101). Mr. H. J. Elwes says it is "not so common, in Sikkim, as *Rhadamanthus* [*Æucus*], but has a wider range of elevation, and occurs during a longer period of the year" (Tr. Ent. Soc. 1888, 422). According to Mr. L. de Nicéville it is "still more common in Sikkim than *Rhadamanthus*, occurring with it and at the same time of the year" (Sikk. Gaz. 1894, 170). Mr. G. C. Dudgeon obtained it at Buxa, in Bhotan. Col. C. Swinhoe records it as "common in the Khasia Hills" (Tr. Ent. Soc. 1893, 311). Mr. Wood-Mason and de Nicéville says "one male and female were taken at Irangmara in July and August, and a female at Sildubi, in Cachar, in July" (J. A. Soc. Beng. 1886, 373). Col. C. H. E. Adamson obtained it at "Akyab in October, also in Moulmein, Rangoon, and Bhamo, Burma.

Caught occasionally from June to November" (List 1897, 46). Mr. F. E. Dempster obtained it at "Lamtok in the Chin-Lushai Hills, in April" (J. Bombay N. H. S. 1890, 6).

Of our illustrations on Plate 420, fig. 1 is from a Sikkim male, fig. 1a from a Karen Hill male, fig. 1b from a Bhotan female, and fig. 1c from a Karen Hill female.

**ORNITHOPTERA HELIACONOIDES** (Plate 421, fig. 1, 1a, ♂, 1b, c, ♀).

*Ornithoptera Heliaconoides*,\* Moore, Proc. Zool. Soc. Lond. 1877, p. 592, ♂ ♀. Wood-Mason and de Nicéville, Journ. As. Soc. Bengal, 1880, p. 237.

*Ornithoptera Pompeus*, Wood-Mason and de Nicéville, J. As. Soc. Beng. 1881, p. 252.

*Troides Helena Cerberus* (part), Rothschild, Nov. Zool. ii. p. 219 (1895).

*Pompeoptera Pompeus* (form *Cerberus*) part, Rippon, Monog. Ornith. ii. p. 55 (1895).

IMAGO.—Male. Upperside. *Forewing* either entirely rich black, or with very slightly defined narrow streaks paler than the ground colour bordering the outer veins, those on the medians being slightly grey-scaled. *Hindwing* golden yellow, with black abdominal border, base of cell and costal band, and outer marginal band formed of six continuous conical portions, the first or anal being elongate and constricted or broken at its apex, the second, third, fifth, and sixth portion each with a contiguous discal small upper round spot, sometimes there is only the second spot present, and occasionally this latter is also absent; veins black. Cilia slightly alternated with white. Underside as above. *Forewing* with the outer veins very slightly paler than the ground-colour, or, with distinct bluish-grey bordering streaks. *Hindwing* with the inner edge of submedian vein and the lower conical portions of the marginal band speckled with green scales.

Female. Upperside. *Forewing* either entirely rich black, or with prominent greyish-white narrow streaks bordering the outer veins and within end of the cell, these streaks being confined more towards the base of the veins than in N.E. Indian and Burmese examples of *O. Cerberus*. *Hindwing* golden-yellow, with black costal and outer marginal continuous conical band, and a discal series of five conical spots, the abdominal margin brownish-black. Cilia alternated with white. Underside. *Forewing* with slightly paler outer vein streaks than the ground colour, or with the lower veins outwardly slightly speckled with bluish-grey scales, or the outer veins and end of cell have prominent bluish-grey bordering streaks. *Hindwing* as on upperside.

Head and thorax, antennæ, and legs black, collar and sides of thorax beneath

\* Misprinted *Heliconoides*.

crimson; abdomen above olivescence-brown, almost black at the base, with yellow segmental bands in the male. Abdomen beneath yellow, with a slightly apparent lateral row of black spots in the male, and two distinct rows in the female.

Expanse, ♂ 6 to  $6\frac{1}{2}$ , ♀  $6\frac{1}{2}$  to  $6\frac{3}{4}$  inches.

HABITAT.—Andaman Isles.

DISTRIBUTION.—Obtained by the late Mr. F. de Roepstorff at Port Blair, S. Andamans. It has also been taken on Little Brother Island.

**ORNITHOPTERA ÆACUS** (Plate 422, fig. 1, 1a, ♂ ♀).

*Ornithoptera Æacus*, Felder, Wien. Entom. Monats. iv. p. 225, ♀ (1860); *id.* Verh. Z. B. Ges. Wien. 1864, p. 291.

*Troides Æacus*, Rothschild, Nov. Zool. ii. p. 223, ♂ ♀ (1895).

*Troides (Pompeoptera) Æacus*, de Nicéville, Journ. Bombay N. H. S. 1898, p. 591).

*Ornithoptera Rhadamanthus*, Boisduval (*nec* Lucas), Spec. Gén. Lep. i. p. 180, ♀ (1836). Doubleday and Hewitson, Gen. D. Lep. i. p. 4 (1846). Moore, Catal. Lep. Mus. E. I. C. i. p. 80 (1857); *id.* Proc. Zool. Soc. 1865, p. 755. Druce, P. Z. S. 1874, p. 108. Distant, Rhop. Malay. p. 326, pl. 27a, fig. 5 ♂, p. 327, fig. 106, ♀ (1885). Elwes and de Nicéville, Journ. As. Soc. Bengal, 1886, p. 438. Wood-Mason and de Nicéville, *id.* 1886, p. 373. Elwes, Trans. Ent. Soc. Lond. 1888, p. 422. Manders, Tr. Ent. Soc. 1890, p. 535. Watson, Journ. As. Soc. Beng. 1891, p. 53. Swinhoe, Tr. Ent. Soc. 1893, p. 311. Leech, Butt. of China, ii. p. 513 (1893). de Nicéville, Sikkim Gazetteer, 1894, p. 170.

*Ornithoptera Rhadamanthus*, var. *Thomsoni*, Bates, in Thomson's Straits of Malacca, p. 546, ♂ (1875).

IMAGO.—Male. Upperside. *Forewing* rich black; outer veins bordered with sullied-grey scaled streaks, which are most distinct from below the base of lower median, where they are slightly yellowish, and thence decrease anteriorly; similar streaks also slightly apparent within end of the cell. Cilia alternated with white. *Hindwing* rich golden-yellow; base and anterior border to the costal vein, a marginal narrow band of conical marks, and the abdominal border black, the three subanal cones being inwardly broadly bordered with blackish powdered scales, and very rarely, a small black inner spot is present in the lower median interspace; abdominal fringe brown; cilia black; veins slenderly black. Underside. *Forewing* paler black, with the pale bluish-grey streaks more distinctly defined, and the lower yellowish-scaled. *Hindwing* as above, except that the abdominal margin is brown, and the black scaled bordering to the subanal cones are visible by semi-transparency in some lights.

Female. Upperside. *Forewing* deep brownish-black or dull black, the sullied grey streaks bordering the outer veins, very prominent and broad all along the



veins, and within the cell to near its base. *Hindwing* golden-yellow; with broad black base and costal border, marginal band of continuous cones, and a discal row of large elongated conical spots, the subanal cones inwardly bordered with blackish powdery scales. Veins thickly black lined. Cilia of both wings alternated with white. Underside as above. *Forewing* with the vein streaks bluish-grey. *Hindwing* with the subanal cones bordered with greenish scales.

Head and thorax black; collar black or crimson; sides of thorax beneath crimson; abdomen above greyish-black, with yellow segmental bands in the male; abdomen beneath yellow, with a lateral row of black spots in male and two lateral rows in female; anal valves of male pinkish-white. Antennæ and legs black.

Expanse, ♂  $5\frac{1}{2}$  to  $6\frac{1}{2}$ , ♀ 6 to  $7\frac{1}{2}$  inches.

HABITAT.—Western, Central, and Eastern Himalayas; Assam, Khasia Hills; Burma; Shan States; Siam; Tenasserim; Malay Peninsula; W. China.

DISTRIBUTION AND HABITS.—We possess both sexes from Masuri, N. W. Himalaya, taken by the late Capt. T. Hutton; also both sexes from Nepal, taken by the late Genl. G. Ramsay. Mr. P. W. Mackinnon records it as “very common in a valley N. E. of Masuri, in Tehri Gurhwal, in May, flying high up amongst the flowers of the wild horse-chestnut trees (*Æsculus indica*); this being most probably the most westerly point of its range” (Journ. Bombay N. H. Soc. 1898, 591). Mr. H. J. Elwes records it as “common in Sikkim, in the hot valleys at 2000 to 3000 feet elevation, where it flies with a slow sailing flight about the flowering trees, which it frequents, from May to October” (Tr. Ent. Soc. 1888, 422). Col. C. Swinhoe has received “many examples from the Khasia Hills” (Tr. Ent. Soc. 1893, 311). Capt. Mortimer Slater says it is “common at Dacca and Darjiling, being partial to the feathery scarlet-flowered plant about which they hover, and may be easily caught by the hand” (MS. Notes). Mr. Wood-Mason records “two females taken on Nemotha Peak, Cachar, in September” (J. A. S. Beng. 1886, 373). Col. C. H. E. Adamson says “this is not an uncommon species in Central Burma. It is most abundant from June till September. In Lower Burma it is not so common. I have also seen what was evidently a fresh brood flying at Sagaing, near Ava, in February. I have found pupæ in August, from which have emerged perfect insects in September” (List of Burmese Butt. 1897, 46). We possess specimens from the Yeh District, Burma, taken by Col. Adamson in August and September; Ruma, Chittagong Hills, August; Upper Mekong, Shan States, taken by J. Roberts, C. I.; “very common in the low valleys, Shan States, from 800 to 3000 feet elevation” (Dr. Manders, Tr. Ent. Soc. 1890, 535); Thoungyeen and Houndraw, Upper Tenasserim, March and November, taken by Col. C. T. Bingham. Capt. E. Y. Watson records “a single male taken in the Chin Hills at 3500 feet, during the rains” (J. Bombay N. H. S. 1897, 671).

## INDO-MALAYAN SPECIES.

*Trogonoptera Brookiana* (Ornith. Brookiana, Wallace, Proc. Ent. Soc. Lond. 1855, p. 104, ♂. Staudinger, Exot. Schmett. i. p. 5, pl. 2, fig. ♂ (1884). O. Brookeana, Hewits. Exot. Butt. i. pl. 1, fig. 1, ♂ (1855). Oberthür, Etud. Ent. iv. p. 32 (1879). Distant, Rhop. Malay, p. 467 (1886). Pap. Trogon, Vollenhoven, Tijd. v. Ent. iii. pp. 72, 88, pl. 6, fig. ♂ (1860). Trogonoptera Brookeana, Rippon, Icones Ornith. i. p. 4 (1889); ii. p. 2, pl. 26, figs. 1-4 ♂ ♀ (1895). Kirby, Allen's Nat. Hist. Butt. ii. p. 259, fig. 1 ♂ (1891). Troides Brookianus, Rothschild, Nov. Zool. ii. p. 198 (1895). Ornith. Brookeana, var. Eleanor, Walker, Trans. Ent. Soc. 1889, p. 75, ♀. Rippon, l.c. ii. p. 2, pl. 26, fig. 5, 6, ♀ (1889). *Habitat.* Borneo; Balabac; Sumatra; Natuna Islands.

*Trogonoptera albescens* (Troides Brookianus, *subsp.* albescens, Rothschild, Nov. Zool. ii. p. 199 (1895). O. Brookeana, Distant, Rhop. Malay, p. 330, pl. 27a, fig. 4, ♀, pl. 27b, fig. 1 ♂ (1885). Fickert, Zool. Jahrb. p. 749, pl. 21, fig. 8, ♀ (1889). *Habitat.* Malay Peninsula.

*Trogonoptera Trojana* (O. Trojana, Staudinger, Iris, ii. p. 4, ♂ (1889). Watkins, Entom. 1891, p. 177, pl. 4, ♂. Semper, Phil. Tagfal. p. 263 (1891). Troides Trojanus, Rothschild, Nov. Zool. ii. p. 199 (1895). Rippon, Icon. Ornith. ii. p. 5, pl. 27, fig. 1, 2, ♂ (1898). *Habitat.* Palawan.

*Ornithoptera Vandepolli* (Pap. Vandepolli, Snellen, Tijd. v. Ent. 1890, p. 22. Fruhst. Berl. Ent. Zeit. 1894, p. 241, pl. 17, fig. 1, ♂ ♀. Troides Vandepolli, Rothschild, Nov. Zool. ii. 205 (1895). Pompeoptera Vandepolli, Rippon, Icon. Ornith. ii. p. 19, pl. 32, figs. 1-4, ♂ ♀ (1895). *Habitat.* Java.

*Ornithoptera Honrathiana*, Martin, Berl. Ent. Zeit. 1892, p. 492, *id.* Nat. Tijd. v. Ned. Ind. 1893, p. 1. Troides Vandepolli Honrathianus Rothschild, Nov. Zool. ii. p. 205 (1895). Pompeoptera Honrathiana, Rippon, Ic. Ornith. ii. p. 21, pl. 33, figs. 1-4, ♂ ♀ (1895). *Habitat.* Sumatra.

*Ornithoptera Helena* (Pap. Helena, Linn. Syst. Nat. x. ed. p. 461 (1758)—*typus jig.* Merian, Ins. Sur. pl. 72, ♂). Troides Helena (part), Rothschild, Nov. Zool. ii. p. 216 (1895). *Syn.* Pap. Pompeus, Cram. i. p. 39, pl. 25, fig. A, ♀ (1775). Esper, p. 101, pl. 24, fig. 2 (1792). Pap. Astenous, Fabr. Syst. Ent. p. 448, ♀ (1775). Jablonsky, Nat. Schmett. i. p. 20, pl. 2, fig. 3 (1784). Pap. Heliacón, Fabr. Ent. Syst. iii. 1, p. 19, ♂ (1793). Donovan, Ins. Ind. pl. 19, ♂ (1800). Amphrisius Nymphalides, Swains. Zool. Illust. iii. pl. 93, ♂ (1833). Pap. Amphrisius, Horsfield, Catal. Lep. Mus. E. I. C. pl. 4, fig. 13, a-e, larva and pupa (1828). Ornith. Jupiter, Oberthür, Et. Ent. iv. p. 31, pl. 1, fig. 1 (1879). O. Pluto, Feld. Verh. Z. B. Ges. Wien. 1860, p. 291. O. rutilans, Oberth. l.c. p. 32, pl. 1, fig. 2. O. Holzi, Pagenst.

Jah. Nass. Verh. Nat. 1890, p. 103. Pompeoptera Pompeus, Rippon, *l.c.* ii. p. 53, pl. 56 (1895). *Habitat.* Java; S.E. Sumatra.

*Ornithoptera Nereis*, Doherty, Journ. As. Soc. Bengal, 1891, p. 30. Pompeoptera Nereis, Rippon, *l.c.* ii. p. 51, pl. 54 (1892). Troides Helena Nereis, Rothschild, *l.c.* ii. p. 218 (1895). *Habitat.* Engano Island.

*Ornithoptera Formosanus* (Troides Æacus Formosanus, Rothschild, Nov. Zool. vi. p. 67 (1899). *Habitat.* Formosa.

*Ornithoptera Rhadamantus*, Lucas, Lep. Exot. p. 5 (1835). Staudinger, Exot. Schmett. p. 4, pl. 1, ♂ ♀ (1884). Troides Rhadamantus, Rothschild, Nov. Zool. ii. p. 224 (1895). Pap. Astenous, Esch. Kotz. Voy. iii. p. 205, pl. 4, fig. 6, a-c, ♂ ♀. O. Amphrisius, Lucas, Lep. Exot. pl. 2, fig. 1. O. Nephereus, Semper, Phil. Tagfalt. p. 264 (1891). *Habitat.* Philippines.

*Ornithoptera Plateni*, Staudinger, Iris, i. p. 274 (1888); *id.* ii. p. 3, ♂ ♀ (1889). Pompeoptera Plateni, Rippon, *l.c.* ii. p. 65, pl. 62, ♂ ♀ (1890). Troides Rhadamantus Plateni, Rothschild, *l.c.* p. 226 (1895). *Habitat.* Palawan.

*Ornithoptera Miranda* (Pap. Miranda, Butler, Lep. Exot. i. p. 3, pl. 1, ♂ (1869). Troides Mirandus, Rothschild, *l.c.* p. 227 (1895). Pompeoptera Miranda, Rippon, *l.c.* ii. p. 70 (1896). *Habitat.* N. Borneo.

*Ornithoptera Andromache*, Staudinger, Iris, v. p. 393 (1892); *id.* vii. p. 341, pl. 8, fig. 1, 2, ♂ ♀ (1895). Troides Andromache, Rothschild, *l.c.* p. 228 (1895). Pompeoptera Andromache, Rippon, *l.c.* ii. p. 73 (1896). *Habitat.* N. Borneo.

*Ornithoptera Amphrysus* (Pap. Amphrysus Cram. Pap. Exot. iii. p. 43, pl. 219, fig. A, ♂ (1782). Jablonsky, Nat. Schmett. i. p. 197, pl. 1, fig. 3 (1784). Esper, Ausl. Schmett. p. 133, pl. 34, fig. 1 (1792). O. Amphrisius, Boisd. Spec. Gén. Lep. i. p. 178, pl. 1, B, fig. 1, ♂ (1836). Aërnauta Amphrisius, Berge, Schmett. p. 106, pl. 36, fig. 2, ♂ (1842). Troides Amphrysus, Rothschild, *l.c.* p. 228 (1895). *Habitat.* Java.

*Ornithoptera Cuneifer* (Ornith. Amphrisius, *aber.* Cuneifer, Oberthür, Et. Ent. iv. p. 110. ♂ (1879). Troides Amphrysus Cuneifer, Rothschild, *l.c.* p. 229 (1895). *Syn.* Ornith. Ritsemæ, Snelten, Notes Leyd. Mus. p. 153, ♂ ♀ (1889). *Habitat.* Mountains of Java.

*Ornithoptera Flavicollis*, Druce, Proc. Zool. Soc. Lond. 1873, p. 356; Skertchley, Ann. Nat. Hist. 1889, p. 210. Rippon, *l.c.* ii. p. 49, pl. 51, figs. 3-5, ♂ ♀. Troides Amphrysus Flavicollis, Rothschild, *l.c.* p. 231 (1895). O. ruficollis, Butler, Trans. Linn. Soc. Zool. i. p. 552, ♂ (1877). Distant, Rhop. Malay. p. 328, pl. 27, fig. 1, ♂; p. 329, fig. 107, ♀; pl. 27 A, fig. 1, ♀ (1885). Pompeoptera ruficollis, Rippon, *l.c.* ii. p. 50, pl. 51, fig. 1, 2, ♂ (1891). Ornith. Olympia, Honrath, Ent. Nachr. 1891, p. 241; *id.* Berl. Ent. Zeit. 1891, p. 429, pl. 15, fig. 1, ♀. Troides nigricollis et brunneicollis, Fruhst. Berl. Ent. Zeit. 1898, p. 419. *Habitat.* Borneo; Sumatra; Malay Peninsula.

*Ornithoptera Niasicus* (O. Amphrysus Niasicus, Fruhst. Berl. Ent. Zeit. 1897, p. 306. *Habitat.* Nias.

*Ornithoptera Sumatranus* (Ornith. Ritsemæ, var. Sumatranus, Hagen, Iris, vii. p. 19 ♂ (1894). *Troides Amphrysus Sumatranus*, Rothschild, *l.c.* ii. p. 232 (1895). *Habitat.* Mountains of Sumatra.

*Ornithoptera Magellanus*, Felder, Wien. Ent. Monats. vi. p. 282 (1862); *id.* Reise Nov. Lep. i. p. 14, pl. 5, fig. a, b, ♂ ♀ (1865). *Troides Magellanus*, Rothschild, *l.c.* ii. p. 232 (1895). Rippon, *l.c.* ii. p. 75, pl. 67, ♂ ♀ (1896).

### Genus PANGERANA.

*Pangerana*, Moore, Journ. Linn. Soc. Zool. 1886, p. 51.

*Papilio* (sect. 66), Felder, Verh. Z. B. Ges. Wien. 1864, pp. 325, 372.

*Papilio* (Nox group, part) Wallace, Trans. Linn. Soc. xxv. p. 23 (1865). Rothschild, Nov. Zool. ii. p. 255 (1895).

*Papilio* (part), Doubleday & Hewitson, Gen. D. Lep. i. p. 5 (1846).

IMAGO.—Male. *Forewing* elongated, triangular; costa arched, apex rounded, exterior margin very oblique and even, posterior angle obtuse, posterior margin very short; cell long, extending to two-thirds the wing, broad; costal vein extending to three-fourths the margin; first subcostal branch emitted at about two-sixths and second branch at one-sixth before end of the cell, third branch from end of the cell, arched, fourth and fifth branch at about one-half beyond the cell; upper discocellular shortest, straight, second slightly recurved, upper radial from the angle, lower radial from end of the cell, forming a fourth median branch, second and third medians widest apart; submedian recurved from its base, its lower branch rather long. *Hindwing* very short, elongated posteriorly; exterior margin slightly convex anteriorly and truncatedly rounded posteriorly, slightly scalloped; abdominal margin twice folded broadly over on to the upperside, and there forming a lengthened flat triangulate lappet, which covers an elongated patch of androconial downy-scales placed between the submedian and anal angle; edge of abdominal margin fringed with long fine hairs. If the abdominal lappet is unfolded the wing is then somewhat quadrate in shape; precostal vein long, bifid, its inner branch short and truncate, outer branch long, joining the costal vein and forming an elongated basal-costal cell; costal vein much arched; cell very long, extending to nearly two-thirds the wing; first subcostal emitted at fully one-half and second at one-fourth before end of the cell; discocellular very short, the radial and upper median branch being emitted close together; lower median at one-fourth before lower end of the cell, and outwardly curved; submedian vein much recurved and widely separated from the lower median branch.

*Thorax* moderately stout, densely hairy; head hairy; palpi very small; abdomen elongated, scaled; antennæ moderately long, club slender and elongated; legs long, slender; fore tibial spur covered with a lateral hairy tuft.

Female. Both wings larger than in the male. *Forewing* broader. *Hindwing* broader, more convex posteriorly; the abdominal margin longitudinally wrinkled between the median and submedian vein.

TYPE.—P. Varuna.

**PANGERANA ASTORION** (Plate 423, fig. 1, 1a, ♂, 1b, ♀).

*Papilio Astorion*, Westwood, Ann. & Mag. Nat. Hist. ix. p. 37, ♂ (1842); *id.* Arcana Ent. ii. p. 69, pl. 66, fig. 1, ♂ (1844). Oberthür, Etud. Ent. iv. p. 33 (1879). de Nicéville, Journ. As. Soc. Bengal, 1881, p. 59. Elwes, Trans. Ent. Soc. Lond. 1888, p. 422.

*Papilio Chara*, Westwood, Ann. & Mag. Nat. Hist. ix. p. 37, ♀ (1842); *id.* Arcana Ent. ii. p. 69, pl. 66, fig. 2, ♀ (1844).

*Papilio (Pangerana) Astorion*, Wood-Mason & de Nicéville, Journ. As. Soc. Bengal, 1886, p. 387. de Nicéville, Sikkim Gaz. 1894, p. 170.

*Papilio Varuna*, Moore, Catal. Lep. Mus. E. I. Compy, i. p. 98 (1857); *id.* Proc. Zool. Soc. Lond. 1865, p. 756. Oberthür, Etud. Ent. xvii. p. 1 (1893).

*Pangerana Varuna*, Moore, Proc. Linn. Soc. Zool. 1886, p. 51. Swinhoe, Trans. Ent. Soc. Lond. 893, p. 312.

*Papilio Varuna*, subsp. *Astorion*, Rothschild, Nov. Zool. ii. p. 260 (1895).

IMAGO.—Male. Upperside. Both wings rich glossy blue-black, in some with a slight greenish or purplish gloss in some lights. *Forewing* darkest basally, and with longitudinal pale streaks between the outer veins except below the submedian, and less apparent similar streaks within the cell. *Hindwing* with the cell area intensely black; and when the marginal lappet is unfolded the abdominal area, from below the cell to middle median, is dark greyish or sepia-brown, with a small paler anal androconial patch, and a fringe of long fine hairs bordering the inner marginal edge. Underside. *Forewing* with paler bluish or bluish-grey longitudinal streaks, palest posteriorly. *Hindwing* uniformly coloured. *Thorax* and abdomen above black; collar, frontal tuft and palpi, sides of thorax beneath, and abdomen beneath rich crimson, the latter with black cross-bands and lateral spots.

Female. Both wings broader. Upperside. *Forewing* with paler and distinctly defined streaks within the cell and bordering the outer veins, these streaks being either bluish-grey of varying shades, or olivescent-grey, and are broadest and palest in the lower median and submedian interspaces. *Hindwing* paler and more olivescent than in the male; with the entire cell-area and the outer interspaces of the veins, medially and longitudinally to the margin darkest. In an extreme aberration, from

Darjiling, in the British Museum collection, the discal interspaces of the hindwing are distinctly whitish and inwardly irrorated with dark scales of the ground colour. Underside. *Forewing* as on upperside, but with paler streaks. *Hindwing* blacker. *Body* same as in male, the sides of abdomen being paler.

Expanse, ♂  $3\frac{2}{10}$  to  $4\frac{2}{10}$ , ♀  $4\frac{2}{10}$  to 5 inches.

HABITAT.—Sikkim; Bhotan; Assam; Khasia Hills; Burma; Tenasserim.

DISTRIBUTION.—“This species is not uncommon in both sexes, in Sikkim, at low elevations, and is found up to 7,000 feet. It occurs from April to December” (H. J. Elwes, Tr. Ent. Soc. 1882, 422). L. de Nicéville also records it as “common in Sikkim from April to December, and from the level of the Terai up to 7,000 feet elevation.” (Sikk. Gaz. 1894, 170). Col. C. Swinhoe records it from the Khasia Hills. (Tr. Ent. Soc. 1893, 312). Mr. J. Wood-Mason took “four males and five females at Irangmara, Cachar, in May and August; the female emitting a stong and disgustingly rank musky odour” (de Nicéville, J. A. S. Beng. 1886, 375). Col. C. H. E. Adamson obtained “a male at Bhamo, Burma, in April, and females in Arakan also in April” (List Burm. Butt. 1897, 46). Dr. J. Anderson obtained “females only at Thaing, King Island, Mergui Archipelago, in January and February” (J. Linn. S. Zool. 1886, 51). We possess specimens from Bhotan, taken in April by Mr. G. C. Dudgeon, Shillong, Assam, and Khasia Hills; and a female from Mergui.

**PANGERANA AIDONEUS** (Plate 424, fig. 1, 1a, ♂ ♀).

*Papilio Aidoneus*, Doubleday, Ann. & Mag. Nat. Hist. xvi. p. 178, ♂ (1845); *id.* Gen. D. Lep. i. p. 9 (1846). Gray, Catal. Lep. B. M. i. p. 8 (1852). Felder, Verh. Z. B. Ges. Wien. 1864, p. 325. Elwes, Trans. Ent. Soc. Lond. 1888, p. 423. Mauders, Tr. Ent. Soc. Lond. 1890, p. 535. Rothschild, Nov. Zool. ii. p. 257 (1895).

*Papilio (Pangerana) Aidoneus*, de Nicéville, Sikkim Gaz. 1894, p. 170.

*Papilio Erioleuca*, Oberthür, Etudes Ent. iv. p. 33, pl. 3, fig. 1, ♂ (1879); *id.* xvii, p. 1 (1893). de Nicéville, Journ. As. Soc. Bengal, 1883, p. 98, ♀.

*Papilio (Pangerana) Erioleuca*, Wood-Mason & de Nicéville, Journ. As. Soc. Bengal, 1886, p. 375.

IMAGO.—Male. Upperside bluish-black. *Forewing* darkest basally, with longitudinal paler streaks within the cell and bordering the outer veins, in some these streaks are more distinct and of either a paler bluish or purpurescent colour. *Hindwing* uniformly bluish-black; abdominal margin longitudinally folded over on to the upperside and forming a lappet with curved edge and hairy upper surface, the lappet, when unfolded, exposing an anal large and broad oval patch of white appressed woolly androconial scales, the anal edge of the patch being also tinged with crimson. Underside paler. *Forewing* with the cell and vein streaks, from the base, of a

uniformly paler bluish-grey or purpurescent-grey colour. *Hindwing* uniformly paler. *Thorax* and abdomen above black; collar, front of head and palpi, sides of thorax beneath, and abdomen beneath crimson; sides of abdomen pale ochreous; abdomen with black lateral dots and segmental bands beneath; antennæ and legs black.

Female. Both wings broader. Upperside paler. *Forewing* with uniformly paler fuliginous streaks within the cell and between the veins, the black veins and their longitudinal interspaces being prominent. *Hindwing* greyish fuliginous-black or greyish bluish-black, the outer marginal interspaces darkest, and longitudinally wrinkled between the lower median and submedian. Front of head and palpi, collar, sides of thorax beneath, and abdomen beneath pale crimson, the sides of abdomen being ochreous-white.

Expanse, ♂ 4 to  $4\frac{1}{2}$ , ♀  $4\frac{1}{2}$  to 5 inches.

HABITAT.—W. & E. Himalaya; Burma; Shan States; Tonkin.

DISTRIBUTION.—Capt. A. M. Lang (*Epist.* Nov. 13, 1869) records it from Masuri, N. W. Himalaya. Mr. P. W. Mackinnon obtained "a single male in Masuri in April, and also a few in Tehri Garhwal in May" (*J. Bombay N. H. Soc.* 1898, 592). Mr. W. Rothschild records it from "Kumaon, taken by Dr. Pilcher in July" (*Nov. Zool.* ii. 258): Mr. Wood-Mason obtained "a male at Irangmara, Cachar, in August, and a female on Nemotha Peak, Cachar, in September" (*J. A. S. Beng.* 1886, 375). We possess specimens from Nepal, Darjiling, and Buxa, Bhotan. Mr. H. J. Elwes says, "this species is not uncommon in Sikkim at 2000 to 3000 feet elevation, from April to November" (*Tr. Ent. Soc.* 1888, 423). Mr. L. de Nicéville records it "as far rarer than *Astorion* in Sikkim, and found up to 3000 feet from April to November (*Sikk. Gaz.* 1894, 170). Col. C. H. E. Adamson took "a male and female on the Naaf and Mayu road in Arakan, in October" (*List. Burm. Butt.* 1897, 46). Dr. N. Manders found it "not uncommon in the Shan States. It is fond of the deep shade of forest trees overhanging streams, under which it flies with a slow graceful flight" (*Tr. Ent. Soc.* 1890, 535). It is also recorded from Tonkin (Oberthür, *Et. Ent.* 1893, 1).

#### PANGERANA ZALEUCUS (Plate 425, fig. 1, 1a, ♂, 1, b, c, ♀).

*Papilio Zaleucus*, Hewitson, *Exotic Butt.* iii. *Pap.* pl. 7, fig. 24, 25, ♂ ♀ (1865). Moore, *Proc. Zool. Soc. Lond.* 1878, p. 841. Oberthür, *Etudes Ent.* xvii. p. 1 (1893). Rothschild, *Nov. Zool.* ii. p. 261 (1895).

*Papilio (Pangerana) Zaleucus*, Elwes & de Nicéville, *Journ. As. Soc. Bengal*, 1886, p. 436.

IMAGO.—Male. Upperside rich blue-black; cilia black. *Forewing* darkest and glossy basally; the outer veins to the submedian and less distinctly within the cell, bordered with dusky bluish-grey streaks. *Hindwing* glossy blue-black, the cell-area

more intensely black; generally with three lower-submarginal triangular white patches, placed in the interspaces of the lower and middle median and radial, the latter one sometimes being the shortest or partly obscured by black scales, and in some specimens a small patch of white scales is also present in the next upper interspace, these patches sometimes—but very rarely—have each a small black spot; the abdominal lappet, when unfolded, exposes an elongated laterally-radiating tuft of androconial hairs. Underside. *Forewing* paler, with distinctly-defined bluish-grey vein and cell streaks. *Hindwing* intensely black; the lower-submarginal white patches broader and forming a continuous band extending from beyond the lower median to the radial, the intersecting median veins being also white, a small dot composed of a few black scales being generally present in each median interspace, and, generally, a more or less small irregular-shaped continuous white patch is present in the interspace above the radial. *Thorax* and abdomen above black; collar, front of head and palpi, sides of thorax beneath and abdomen beneath rich crimson; abdomen beneath with black lateral spots and segmental cross-bands; antennæ and legs black.

Female. Both wings broader. Upperside blue-black as in the male. *Forewing* with the streaks between the veins and within the cell paler and more distinct. *Hindwing* with the white patches much longer than in the male, and forming a large broad lower-discal band extending from anal angle to the lower subcostal branch. Underside. *Forewing* with the cell and vein streaks paler bluish-grey. *Hindwing* longitudinally wrinkled between the median and submedian vein; with the lower-discal broad white band as on the upperside, except that the traversing median veins are also white; cilia from the subcostal to anal angle also white. *Thorax* and abdomen above blue-black; collar, front of head and palpi, sides of thorax beneath and abdomen beneath rich crimson; abdomen beneath with black lateral spots and lower segmental cross-bands; antennæ and legs black.

Expanse, ♂  $3\frac{1}{2}$  to 4, ♀  $4\frac{1}{2}$  to 5 inches.

HABITAT.—Burma; Upper Tenasserim; Shan States; Tonkin.

DISTRIBUTION.—Col. C. H. E. Adamson records it as “very rare in Burma. I captured about half a dozen males and females in Upper Tenasserim during the cold months” (List. 1897, 46). Mr. Ossian Limborg took it on the road from Moulmein to Meetan, Upper Tenasserim, in December” (P. Z. S. 1878, 841). Signor L. Fea obtained it at Cobapo, Karen Hills, in October (MS. Notes). Mr. H. J. Elwes records “two pairs from Ponekai, Tavoy” (J. A. S. Beng. 1886, 436). We possess males from Haundraw Valley, Upper Tenasserim, taken by Col. Bingham in December, and from the Upper Mekong, Shan States, taken by J. Roberts, C.E. Examples are in the British Museum from the Thoungyen Valley, Upper Tenasserim, taken in February, and from Papun in December, by Col. Bingham. In Mr.



P. Crowley's collection are specimens from Toungoo, and a female from the Karen Hills. Mons. Oberthür records it from Tonkin (Et. Ent. 1893, 1.)

INDO-MALAYAN SPECIES.—*Pangerana Priapus* (Papilio Priapus, Boisd. Spec. Gen. Lep. i. p. 190 (1836). De Haan, Verh. Nat. Gesch. Ned. p. 23, pl. 2, fig. 1, ♀ (1840). Haase, Untersuch. üb. Mim. p. 27, pl. 6, fig. 42, ♀ (1893). Rothschild, Nov. Zool. ii. p. 255 (1895). *Habitat.* W. Java.—*Pangerana diluta* (Pap. dilutus, Fruhstorfer, Ent. Nach. 1895, p. 169, ♂ ♀. Pap. Priapus dilutus, Rothschild, *l.c.* p. 255. *Habitat.* E. Java.—*Pangerana Sycorax* (Pap. Sycorax, Grose-Smith, Ent. Mo. Mag. 1885, p. 247. Distant, Rhop. Malay. p. 468, pl. 42, fig. 10, ♀ (1886). Hagen, Iris, 1894, p. 23, ♂. Rothschild, *l.c.* p. 256. Pap. (Pangerana) Sycorax, de Nicéville, J. As. Soc. Bengal, 1895, p. 512. *Syn.* Pap. Egertoni, Distant, Ann. Nat. Hist. 1886, p. 251. *Habitat.* Sumatra; Malay Peninsula.—*Pangerana Hageni* (Pap. Hageni, Rogenhofer, Verh. Z. B. Ges. Wien. 1889, p. 1, ♂. Hagen, Iris, 1894, p. 24, ♂ ♀. Pap. (Pangerana) Hageni, de Nicéville, Journ. Bombay N. H. S. 1893, p. 55, pl. M, fig. 2, ♀, *id.* Journ. As. Soc. Bengal, 1894, p. 45, pl. 4, fig. 6, ♂, *id.* *l.c.* 1895, p. 512. *Habitat.* Battak Mts. Sumatra.—Genus ATROPHANEURA, Reakirt, Tr. Ent. Soc. Philadelphia, 1864, p. 447.—*Atrophaneura Semperi* (Pap. Semperi Felder, Wien. Ent. Monats. 1861, p. 297, ♀; *id.* *l.c.* 1862, p. 282, ♂; *id.* Reise Novara, Lep. i. p. 131, pl. 20, fig. a, b, ♂ ♀ (1865). Staudinger, Exot. Schmett. i. p. 9, pl. 5, fig. ♂ (1884). Semper, Philip. Tagfalt. p. 272, pl. 47, fig. 1, ♀ (1892). Rothschild, *l.c.* p. 256. *Syn.* Atrophaneura erythrosona, Reakirt, *l.c.* p. 447, ♂ (1864). *Habitat.* Luzon; Polillo; Philippines.—*Atrophaneura supernotata* (Pap. Semperi *subsp.* supernotatus, Rothschild, *l.c.* ii. p. 257 (1895). *Syn.* Pap. (Atroph.) Semperi, Semper, Phil. Tagfalt. p. 272, pl. 47, fig. 2, ♀ (1892). *Habitat.* Bohol; Samar; Mindano; Philippines.—*Atrophaneura albofasciata* (Pap. (Atroph.) Semperi, *var.* albofasciatus, Semper, *l.c.* p. 273 (1892). Staudinger, Iris, 1895, p. 349. Rothschild, *l.c.* p. 257. *Habitat.* Panay; Mindoro, Philippines.—*Atrophaneura melanota* (Pap. Semperi, *var.* melanotus, Staudinger, Iris, 1889, p. 13, ♀. Rothschild, *l.c.* p. 257. *Habitat.* Palawan, Philippines.

GENUS KARANGA (Papilio, sect. 66, Felder, Verh. Z. B. Ges. Wien. 1864, pp. 325, 373. Papilio (Group 3, part) Rothschild, Nov. Zool. ii. p. 255 (1895). Male. *Forewing* broader than in *Pangerana*, the costa much arched; apex broadly rounded. *Hindwing* shorter, not prolonged posteriorly, the exterior margin more convex and strongly scalloped; abdominal lappet narrow, its inner edge curved. Female. *Forewing* also broader and more rounded apically. *Hindwing* shorter and broader; exterior margin strongly scalloped.

TYPE. K. Nox.—*Karanga Nox* (Papilio Nox, Swainson, Zool. Illust. iii. pl. 102, ♀ (1822). Horsfield, Catal. Lep. Mus. E. I. C. pl. 1, fig. 15, ♀ (1828). Boisd. Spec. Gen. Lep. i. p. 277 (1836). Lucas, Chenu's Encycl. d'Hist. Nat. Pap. pl. 7

(1851). Westw. Trans. Ent. Soc. Lond. 1872, pp. 91, 93, pl. 4, fig 1, ♂. Rothschild, Nov. Zool. ii. p. 258 (1895). *Syn.* Papilio Memercus, Godt. Encycl. Meth. ix. Suppl. p. 809 (1823). Pap. Neesius, Zinken-Sommer, Nova Act. N. C. xv. p. 152, pl. 14, fig. 4, ♂ (1831). *Habitat.* Java.—*Karanga Noctula* (Papilio Noctula, Westwood, Trans. Ent. Soc. Lond. 1872, p. 90, pl. 4, fig. 3, ♂. Rothschild, *l.c.* ii. p. 259 (1895). *Syn.* Pap. Strix, Westw. *l.c.* p. 92, pl. 4, fig. 4, ♀ (1872). *Habitat.* Borneo.—*Karanga Erebus* (Papilio Erebus, Wallace, Tr. Linn. Soc. Lond. xxv. p. 41, ♀ (1865). Distant, Rhop. Malay. p. 334, pl. 31, fig. 1, 2, ♂ ♀ (1885). Hagen, Iris, 1894, p. 26, pl. 1, fig. 2, *larva.* Rothschild, *l.c.* p. 259 (1895). Pap. (Pangerana) Erebus, de Nicéville, J. As. Soc. Bengal, 1895, p. 513. *Habitat.* Malay Peninsula; Sumatra; Borneo.—*Karanga Petronius* (Pap. Erebus *subsp.* Petronius, Fruhstorfer, Soc. Ent. 1901, p. 90. *Habitat.* Nias.—*Karanga Banjermasina* (Papilio Erebus *subsp.* Banjermasinus, Fruhstorfer, Berl. Ent. Zeit. 1898, p. 427). *Habitat.* S. Borneo.—*Karanga Noctis* (Pap. Noctis, Hewitson, P. Z. S. 1859, p. 423, pl. 66, fig. 5, 6, ♀. Wallace, Tr. Linn. Soc. 1865, pp. 91, 93, pl. 4, fig. 2, ♂, fig. 5, ♀. Rothschild, *l.c.* p. 260 (1895). *Habitat.* Borneo.—*Karanga Henricus* (Pap. Noctis *subsp.* Henricus, Fruhstorfer, Berl. Ent. Zeit. 1898, p. 425. *Habitat.* Battak Mts. Sumatra.—*Karanga Nye* (Pap. Nox. *var.* Nyx, de Nicéville, Ann. Nat. Hist. 1897, p. 255. *Habitat.* Bali.

#### Genus BYASA.

*Byasa*, Moore, Proc. Zool. Soc. Lond. 1882, p. 258.

*Panosmia*, Wood-Mason and de Nicéville, Journ. As. Soc. Bengal, 1886, p. 374.

*Papilio* (part), Doubleday and Hewitson, Gen. D. Lep. i. p. 5 (1846).

*Papilio* (Group 4), Rothschild, Nov. Zool. ii. p. 261 (1895).

IMAGO.—Male. *Forewing* elongated, triangular; costa much arched, apex rounded, exterior margin very long, extremely oblique and slightly convex, posterior margin short; cell large, extending to nearly two-thirds the wing. *Hindwing* narrow, much prolonged posteriorly; anterior margin very short, exterior margin deeply scalloped and with a very broad short spatular tail at end of upper median veinlet; cell long, pointed at the end; abdominal margin folded over on to the upperside and forming a lappet covering a lengthened patch of densely-packed androconial woolly-hairs; costal vein and subcostals short. *Body* rather short and slender; anal valves short, rounded and hairy scaled; hind tibiæ not incrassated; antennæ short, with a gradually thickened club.

LARVA.—Cylindrical; with several short fleshy tubercles on each segment; and a nuchal flattened corneous tentacular-sheath.

PUPA.—Rather broad laterally; head broad and slightly cleft in front; thorax convex above and beneath, angular at the sides; wing-cases dilated laterally; abdominal segments with lateral foliaceous appendages.

TYPE.—B. *Philoxenus*.

**BYASA PHILOXENUS** (Plate 426, fig. 1, *larva* and *pupa*, 1a, b, ♂; 1c, d, ♀).

- Papilio Philoxenus*, Gray, Zool. Misc. p. 32 (1831); *id.* Lep. Ins. Nepal, p. 5, pl. 2, ♀ (1846). Boisduval, Spec. Gen. Lep. i. p. 264 (1836). Doubleday and Hewitson, Gen. D. Lep. i. p. 9 (1846). Westwood, Cab. Orient. Ent. p. 81, pl. 40, fig. 2, ♂ (1848). Gray, Catal. Lep. Brit. Mus. i. p. 9 (1852). Moore, Catal. Lep. Mus. E. I. Company, i. p. 96 (1857). Felder, Verh. Z. B. Ges. Wien. 1864, p. 325. Staudinger, Exot. Schmett. i. p. 9, pl. 5, ♂ (1884). Elwes, Trans. Ent. Soc. Lond. 1888, p. 426. Manders, Tr. Ent. Soc. Lond. 1890, p. 535. de Nicéville, Journ. As. Soc. Bengal, 1890, p. 387. Oberthür, Etud. Ent. xvii. p. 2 (1893). Leech, Butt. of China, ii. p. 538 (1893). Rothschild, Nov. Zool. ii. p. 264 (1895).
- Byasa Philoxenus*, Moore, Proc. Zool. Soc. Lond. 1882, p. 259, pl. 12, fig. 5, 5a, *larva* and *pupa*. Swinhoe, Tr. Ent. Soc. Lond. 1893, p. 312.
- Papilio (Byasa) Philoxenus*, Doherty, Journ. As. Soc. Bengal, 1886, p. 136. Elwes and de Nicéville, Journ. As. Soc. Beng. 1886, p. 435; de Nicéville, Sikkim Gaz. 1894, p. 171.
- Papilio Polyuctes*, Doubleday, in Gray's Zool. Misc. p. 74 (1842); *id.* Gen. D. Lep. i. p. 9, pl. 2, fig. 3, ♂ (1846).
- Papilio Philoxenus*, var. *Polyuctes*, Westwood, Cab. Orient. Ent. p. 82, pl. 40, fig. 3, ♂ (1848).

IMAGO.—Male. Upperside. *Forewing* rich fuliginous-black, darkest basally; with black veins, and longitudinal narrow streaks between the veins and within the cell. *Hindwing* rich black, darkest posteriorly; with a broad white discal patch between the lower subcostal and radial, this patch being quadrate and with equal sides, or it is elongatedly quadrate, and generally with a lower small white attached triangular spot below it at the basal interspace of the radial and upper median; followed beyond by three submarginal crimson spots, which are generally of a rich tint, the upper spot broadly lunular in shape, the two lower are situated between the medians and are longer and recurved, each touching the marginal angle of the wing, or the lowest or subanal is either constricted or broken in its middle and thus forms two separate spots; a rounded crimson spot also at end of the tail; these crimson spots vary in size in individual specimens, and are sometimes rounded in shape on both upper and under side of the wing; abdominal margin folded over on to the upperside and forming a lappet covering a lengthened broad patch of densely packed androconial greyish-brown woolly-hairs. Underside. *Forewing* uniformly paler. *Hindwing* paler basally, the white discal patch and its lower spot as on the upperside, the latter sometimes edged with crimson, and invariably present, though absent on the upperside, and there is sometimes also, though rarely, a similar

small white upper spot between the subcostals ; the crimson spots, as on the upper-side, brighter, with an additional lower discal irregular crimson streak extending brokenly from the lower white spot to the submedian vein. Thorax and abdomen above black ; streaks on front of thorax, collar, front of head, and sides of thorax beneath, and abdomen beneath crimson ; abdomen beneath with black lateral spots and segmental cross-bands ; anal valves seen from below short and rounded ; antennæ and legs black.

Female. Upperside. Wings broader than in the male. *Forewings* uniformly paler fuliginous, somewhat olivescient tinted, the black streaks regularly and well defined. *Hindwing* olivescient-fuliginous basally ; the two white patches larger, the crimson lower spots more or less paler and speckled with white or black scales ; a lower-discal, irregular, more or less obscurely defined crimson-tinted streak is also generally present, extending from the lower white patch to the submedian vein, this streak in some specimens being more regularly and distinctly defined and entirely whitish, or whitish speckled at either one or both ends. *Body* as in the male.

Expanse, ♂  $3\frac{3}{4}$  to 5, ♀  $4\frac{1}{2}$  to  $5\frac{1}{4}$  inches.

LARVA.— $2\frac{1}{2}$  inches long ; pale purple-brown ; head and legs shining black ; head small, corneous, sparsely covered with short hairs ; second segment with two short tubercles on each side, and a nuchal transverse flattened corneous tentacular-sheath in front ; third, fourth, fifth, and sixth segments each with eight short tubercles—four on each side—the subdorsal series longest ; seventh, eighth, ninth, and tenth segments each with six tubercles, and eleventh, twelfth, and thirteen segments each with four shorter tubercles ; each tubercle is red at the apex and purple-black streaked at the base ; intervening space between the tubercles with a transverse and a dorsal series of paler purple-black spots ; these latter markings all with pale borders ; seventh and eighth segment each with a lateral short broad oblique white band.

PUPA.—Reddish-ochreous ; broad laterally ; head broad and slightly cleft in front ; thorax convex above and beneath, angular at the sides ; wing-cases dilated laterally ; abdominal segments with lateral foliaceous appendages.

HABITAT.—N. W. and E. Himalaya ; Assam ; Burma ; Shan States ; Tenasserim ; Malay Peninsula.

DISTRIBUTION.—The Rev. J. H. Hocking obtained it at Dharmasala, Kangra, N.W. Himalaya, and “ found the larvæ on a creeping pitcher-plant (*Nepenthes*) on September 20th at an elevation of 6200 feet ; the larvæ changed to pupæ on September 27th ; the pupa making a squeaking noise when touched ” (P. Z. S. 1882, 259). Mr. W. Rothschild records a female (under the China form—*Lama*) from Cashmere (Nov. Zool. 11, 266) Mr. W. Doherty obtained it in the “ Pindari Valley, Kumaon, at 7000 feet ” (J. As. Soc. Bengal, 1886, 136). Mr. E. T. Atkinson

(MS. Notes) remarks that *Philoxenus*, *Dasarada*, and *Ravana* fly together at Naini Tal, in September. Mr. H. J. Elwes possesses specimens from Hazara in the extreme N. W. Himalaya" (Tr. Ent. Soc. 1888, 426). A male taken at Murree in August, and a male from Dalhousie taken in May, are in the British Museum. General G. Ramsay obtained numerous specimens in Nepal, of which we possess examples of both sexes. Mr. Elwes records it as "common in Sikkim at the same elevations and in the same months as *Dasarada*" (Tr. Ent. Soc. 1888, 426). Mr. G. C. Dudgeon took it at Buxa, Bhotan. Col. C. Swinhoe has received many specimens from the Khasia and Jaintia Hills. Mr. Ossian Limborg obtained it on the roads from "Moulmein to Meetan, Upper Tenasserim, and from Moolait to Moolat at 4500 feet elevation, in December" (P. Z. S. 1878, 840). Dr. N. Manders found it "abundant in the Shan States, Burmah, and widely distributed" (Tr. Ent. Soc. 1890, 535). We possess both sexes from the Upper Mekong, Shan States, taken by Mr. J. Roberts, C.E. Mr. H. J. Elwes records a "single male from Ponkesai, Tavoy, Tenasserim" (J. A. S. Beng. 1886, 435). It also occurs in Siam, Tonkin, Western China, and the Malay Peninsula.

Of our illustrations on Plate 426, fig. 1 is from our drawing of the larva and pupa preserved by Mr. Hocking; and 1a, b, c, d, from male and female specimens taken in Nepal.

**BYASA DASARADA** (Plate 427, fig. 1, ♂, 1a, b, ♀).

- Papilio Philoxenus*, var. Westwood, Cabinet of Oriental Entom. p. 82, pl. 40, fig. 5, ♀ (1848).  
*Papilio Dasarada*, Moore, Catal. Lep. Mus. E. I. Company, i. p. 96 (1857); *id.* Proc. Zool. Soc. Lond. 1865, p. 757. Oberthür, Etud. Ent. iv. p. 43 (1879). Staudinger, Exot. Schmett. i. p. 9 (1884). Elwes, Trans. Ent. Soc. Lond. 1888, p. 425. Oberthür, Etud. Ent. xvii. p. 3 (1893).  
*Papilio (Panosmia) Dasarada*, Wood-Mason and de Nicéville, Journ. As. Soc. Bengal, 1886, p. 374.  
*Byasa Dasarada*, Swinhoe, Trans. Ent. Soc. Lond. 1893, p. 312.  
*Papilio (Byasa) Dasarada*, de Nicéville, Sikkim Gazetteer, 1894, p. 171.  
*Papilio Philoxenus*, aber. *Dasarada*, Rothschild, Nov. Zool. ii. p. 266 (1893).

IMAGO.—Both sexes larger than *B. Philoxenus*. Male. Upperside. *Forewing* rich fuliginous-black. *Hindwing* longer than in *B. Philoxenus*; rich dark blue-black, darkest posteriorly; the outer marginal angles, anal angle, and the tail much broader; with a single discal white patch, which is larger and less quadrate; the submarginal lunules narrower and recurved, the upper one being white, the lower one whitish anteriorly and sullied crimson posteriorly, the anal one crimson, the tail spot being more or less small and crimson, sometimes obsolescent or absent. Underside. *Forewing* uniformly paler than the upperside. *Hindwing* with the large discal white patch as on the upperside; a small white upper spot is generally present in

the subcostal interspace, and very rarely an indication of a lower minute spot in the basal interspace between the radial and upper median; the upper submarginal lunule is white and edged outwardly with crimson, the others and a short abdominal-marginal streak, and the tail spot are crimson, the lowest lunule being sometimes white-speckled anteriorly.

Female. Upperside. *Forewing* rich dark fuliginous, vein streaks well defined. *Hindwing* dark fuliginous-black basally, blue-black posteriorly; the discal white patch generally larger, and sometimes with an obsolescent or a distinct very small white spot below it, and also, but very rarely, with a moderate-sized white quadrate patch in the subcostal interspace above it; the three submarginal lunules and tail spot much larger than in the male, the upper lunule broad and with its outer upper-point prolonged, both lower lunules being white anteriorly; in some specimens faint traces of a short crimson-scaled streak extends from the anal angle, which in others is more distinct but paler; the tail spot large, either pale crimson or whitish. Underside. *Forewing* paler than upperside. *Hindwing* uniformly black; the discal large white patch as on the upperside. The lower small spot always present, the upper small spot either absent or very minute, or more generally of moderate large size; the marginal lunules as on the upperside, the anal marginal crimson irregular-shaped patch large.

Expanse, ♂ 5 to 5 $\frac{3}{4}$ , ♀ 5 to 6 inches.

HABITAT.—Sikkim; Assam; Khasias; Burma; Tenasserim; Malacca; Shan States; Tonkin.

DISTRIBUTION AND HABITS.—“Occurs not uncommonly in Sikkim, Bhotan, and the Khasia Hills. In Sikkim it seems rarer than *Philoxenus*, and is found from 1000 to 8000 feet elevation, from April to November. I have not observed in this species the nauseous odour which, according to Mr. Wood-Mason, is characteristic of *Philoxenus*, but Mr. de Nicéville says it has the strongest smell of any butterfly he knows. The flight of this butterfly is much less swift than that of many Papilios. It may be seen sailing with a very soft graceful flight along the edge of the clearings and round the flowering trees in the open places. A species of *Albizzia* is one of the favourite trees, but to get fresh specimens one must search for those which, having recently emerged from the pupæ, may be found settled on the low herbage and flowers at the side of the forest-path” (H. J. Elwes, Tr. Ent. Soc. 1888, 426). “A common species in Sikkim, occurring from 1000 to 8000 feet from April till November. The butterfly has a very powerful and disagreeable odour, which is perceptible even years after the death of the insect” (L. de Nicéville, Sikkim Gaz. 1894, 171). Col. C. Swinhoe records it from the Khasia Hills (Tr. Ent. Soc. 1893, 312), and has also received many specimens from Cherra Punji and the Jaintia Hills. Mr. J. Wood-Mason obtained two females on Nemotha Peak, Cachar,

in September and October" (J. As. Soc. Bengal, 1886, 374). Col. C. H. E. Adamson "caught two males at Tounggya Sekkan, Upper Tenasserim, in May" (List Burm. Butt. 1897, 48). Col. C. T. Bingham obtained it at Thoungyen, Upper Tenasserim. We possess specimens from the Upper Mekong, Shan States, taken by Mr. J. Roberts, C.E. It also occurs in Malacca, and Tonkin.

**BYASA RAVANA** (Plate 428, fig. 1, 1a, ♂, 1b, c, ♀).

*Papilio Philoxenus*, var. Westwood, Cabinet of Oriental Entom. p. 81, pl. 40, fig. 4, ♀ (1848).

*Papilio Ravana*, Moore, Catal. Lep. Mus. E. I. Company, i. p. 96 (1857). Felder, Verh. Z. B. Ges.

Wien. 1864, p. 325. Elwes, Trans. Ent. Soc. Lond. 1888, p. 423. Rothschild, Nov. Zool. ii. p. 262 (1895).

*Byasa Ravana*, Moore, Proc. Zool. Soc. Lond. 1882, p. 259.

*Papilio (Byasa) Ravana*, de Nicéville, Sikkim Gaz. 1894, p. 170.

IMAGO.—Male. Upperside. *Forewing* fuliginous-black, with a longitudinal black streak between the veins and similar streaks within the cell. *Hindwing* black, fuliginous basally; with an upper outer-discal white or pinky-white small spot, which is either quadrate, rounded, or obsolescent, or occasionally even absent, in the upper subcostal interspace, and a much larger elongate spot in the lower subcostal interspace, followed below by three submarginal normal-shaped lunules, the upper one broad, whitish and dull crimson scaled outwardly, the other two being narrow, recurved, and darker crimson scaled; the tail spot either small and crimson, or obsolescent; at the anal marginal angle, in some specimens, a few pale crimson scales are more or less present, and a portion of the crimson patch of the underside is visible at end of the marginal hairy lappet. Underside. Both wings paler than the upperside. *Hindwing* with markings as on the upperside; the large discal spot and upper submarginal lunule being outwardly crimson edged, the lower lunules and tail spot brighter crimson, the anal marginal irregular patch large and pale crimson or nearly white. *Thorax* and abdomen above black; streaks on front of thorax, collar, front of head, palpi, and sides of thorax beneath crimson; abdomen beneath crimson, with black lateral spots and segmental cross-bands; antennæ and legs black.

Female. Upperside. *Forewing* paler than in male. *Hindwing* also paler basally; the two upper-discal spots and the upper submarginal lunule somewhat larger and generally whiter, the two lower recurved lunules also larger and whiter anteriorly; the tail spot generally larger; an anal marginal irregular-shaped white patch always present extending from near the submedian to the middle or to the upper median and occasionally to the radial, thus forming a more or less broken lower discal band; occasionally a small white upper spot is also present in the

costal interspace. Underside similar to the upperside, except that the large discal spot and upper lunule are outwardly-edged with crimson, the lower lunules and tail spot being pale crimson, and the anal marginal patch partly crimson tinged.

Expanse ♂ 4 to  $4\frac{1}{2}$ , ♀ 4 to  $4\frac{3}{4}$  inches.

HABITAT.—Western Himalayas.

DISTRIBUTION.—Mr. P. W. Mackinnon records it as “common in Tehri Garhwal, N. W. Himalaya, in April and May” (Journ. Bombay N. H. S. 1898, 592). Capt. Graham Young took it in Kulu (H. J. Elwes, Tr. Ent. Soc. 1888, 424). We possess specimens from Garhwal, taken by Col. Buckley, and from Nepal, taken by General G. Ramsay. Mr. E. T. Atkinson (MS. Notes) remarks that “*Ravana*, *Philoxenus*, and *Dasarada* fly together at Naini Tal, Kumaon, in September.”

**BYASA NEVILLI** (Plate 429, fig. 1, ♂).

*Papilio Nevilli*, Wood-Mason, Ann. and Mag. Nat. Hist. 1882, p. 105, ♂. Rothschild, Nov. Zool. ii. p. 263 (1895).

*Papilio (Panosmia) Nevilli*, Wood-Mason and de Nicéville, Journ. As. Soc. Bengal, 1886, p. 374, pl. 15, fig. 2, 2a, ♂.

*Papilio Chentsong*, Oberthür, Etudes Ent. xi. p. 13, pl. 1, fig. 1 ♂ (1886). Leech, Butt. of China, ii. p. 543 (1893).

IMAGO.—Male. Upperside. *Forewing* fuliginous-black, with a black longitudinal streak between the veins, and others within the cell. *Hindwing* paler fuliginous basally, black posteriorly; with two large upper-discal pink-white spots, placed in the subcostal interspaces, followed by the three lower submarginal bright crimson lunules, and a less-apparent dull crimson streak from the anal angle; a portion of the crimson spot of the underside being also visible at end of the abdominal fold; tail broad, not spatulate, entirely black. Underside. Similar. *Hindwing* with the two large pink-white spots as on the upperside, and with a very small upper pink spot in the costal interspace; the three lower bright crimson lunules larger, and a crimson broken patch crossing the submedian and lower median from the marginal anal angle.

*Thorax* and abdomen above black; streaks on thorax above, collar, front of head and palpi, and abdomen beneath crimson; abdomen beneath with black segmental cross-bands.

Female. Upperside paler. *Hindwing* with the two upper patches white, the upper submarginal lunule either white or very pale crimson.

Expanse, ♂  $4\frac{1}{2}$ , ♀ 4 inches.

HABITAT.—Cachar; W. China.

DISTRIBUTION.—The type specimens of *B. Nevilli* are recorded from the “vicinity of Silchar, in Cachar” (W. Mason, *l.c.* p. 105).



## BYASA LATREILLEI (Plate 430, fig. 1, 1a b, ♂, 1c, ♀).

- Papilio Latreillii*, Donovan, Nat. Rep. iv. pl. 140 (1826). Staudinger, Exot. Schmett. i. p. 9 (1884).  
Elwes, Trans. Ent. Soc. Lond. 1888, p. 425. Rothschild, Nov. Zool. ii. p. 261 (1895).  
*Papilio Minereus*, Gray, Zool. Misc. p. 32 (1831); *id.* Lep. Ins. Nepal, p. 5, pl. 1, ♀ (1846).  
Doubleday and Hewitson, Gen. D. Lep. i. p. 9 (1846). Westwood, Cab. Orient. Ent. p. 81, pl.  
40, fig. 1 ♀ (1848). Moore, Catal. Lep. Mus. E. I. Company, i. p. 97 (1857). Felder, Verh.  
Z. B. Ges. Wien. 1864, p. 325.  
*Papilio (Byasa) Latreillii*, de Nicéville, Sikkim Gazetteer, 1894, p. 171; *id.* Journ. As. Soc. Bengal,  
1897, p. 566.

IMAGO.—Male. Upperside. *Forewing* greyish fuliginous-black, with a black longitudinal streak between the veins, and others within the cell. Cilia black. *Hindwing* greyish fuliginous-black basally, deep black in the posterior interspaces; with a pinkish-white lower-discal patch composed of three portions placed in the interspaces between the lower median and the radial, the outer portions each excavated posteriorly, the inner one more truncated; beyond is an upper submarginal sullied-white or pale crimson-white small spot which is either oval or lunular, below this are the ordinary-placed lower submarginal lunules, a smaller spot at anal angle of lower median, and a tail spot, which are all small and either of a dull pale crimson or bright crimson; abdominal marginal lappet when unfolded displaying a longitudinal androconial patch of white dense woolly hairs. Underside much paler; greyish-fuliginous. *Hindwing* with the three lower discal patches and outer submarginal markings as on the upperside; the lower lunules and tail spot being brighter coloured; a slender continuous lower discal white streak edged with crimson is also present in the submedian interspace, and sometimes an upper white-speckled contiguous dot in the lower subcostal interspace, and also a submarginal small white lunule in the angle of the upper subcostal interspace. *Thorax* and abdomen above fuliginous black; front of thorax above and sides beneath, collar and front of head, and abdomen beneath crimson; abdomen beneath with black lateral spots and segmental cross-bands; anal valves crimson; antennæ and legs black.

Female. Wings broader. Upperside paler than in the male. *Hindwing* with the three portions of the lower-discal white patch somewhat larger, and with an inner narrow portion extending from the lower median to the marginal anal angle, this portion being sometimes crimson edged posteriorly, and also an upper small white or speckled-white spot in the lower subcostal interspace; the submarginal lunules and tail spot somewhat larger. Underside paler than the upper. *Hindwing* with markings as on the upperside, and also with a small white spot within the angle of the upper subcostal interspace, the submarginal lunules and tail spot brighter crimson.

Expanse, ♂ ♀, 4 to 4½ inches.

HABITAT.—N.W. and E. Himalayas.

DISTRIBUTION AND HABITS.—Mr. P. W. Mackinnon records it as “fairly common in May in the valleys to the N.E. of Masuri, N.W. Himalaya” (de Nicéville, J. Bombay N. H. S. 1898, 592). We possess specimens from Masuri, taken by Capt. T. Hutton, and also from Garhwal and Nepal, the latter taken by General G. Ramsay. Col. C. Swinhoe has it from Sikkim, taken in the Lachin Lachoong Valley, at 8000 feet elevation. Mr. H. J. Elwes records it as “not an uncommon species in Sikkim at from 7000 to 9000 feet elevation, where I have several times seen and taken it on Jellapahar, on Sinchal, and the Groompahar ridge. It frequents dense forest, where it flies high over the tops of the trees, from April or even sooner, on into July and August, when most of the females are worn and much broken. It may best be taken, like most of the high-flying forest insects, by waiting on a sunny day at an open space at the top of a hill, or when it occasionally comes down to settle on the path” (Tr. Ent. Soc. 1888, 425). Mr. L. de Nicéville also records it as “occurring in the thick, high forests of Sikkim, from 7000 to 9000 feet, from March to August.” (Sikkim Gaz. 1894, 171).

Our illustrations on Plate 430, figs. 1, 1a, b, represent the males with the abdominal fold both closed and open; and 1c, the female.

**BYASA POLLA** (Plate 429, fig. 2, ♂).

*Papilio (Byasa) Polla*, de Nicéville, Journ. As. Soc. Bengal, 1897, p. 565, pl. 4, fig. 28, ♂.

IMAGO.—Male. “Upperside. Both wings shining black. *Forewing* with the usual deep black longitudinal streaks within the cell, and similar ones between the veins. *Hindwing* with a large discal pinkish-white patch occupying the outer end of the cell, anteriorly bounded by the second subcostal, posteriorly by the first median nervule, the inner half of the portion in the first median interspace being heavily sprinkled with black scales; the outer edge of the patch is scalloped; four large submarginal carmine lunules all irrorated with black scales, the anterior one in the subcostal interspace whitish; tail broadly tipped with carmine; the posterior end of the abdominal fold and the two tooth-like projections of the wing-membrane between it and the tail, as well as the first projection beyond the tail, somewhat broadly edged with carmine.

Underside. Both wings as above, but of a darker shade of black. *Forewing* as on upperside. *Hindwing* with the discal pinkish-white patch extending quite up to the cell but not invading its outer end; the patch is inwardly continued from the first median nervule to the submedian nervule by a carmine spot; the submarginal lunules as above, but of a pure rich carmine, the two inner ones continued to the outer marginal carmine edging of the wing, which latter is broader than on the

upperside, as also is the carmine tip of the tail. *Palpi*, orbits, head, and thorax anteriorly carmine; thorax posteriorly and abdomen above black; thorax and abdomen beneath carmine; anal valves carmine; antennæ and legs black."

Female. Upperside much paler. *Forewing* fuliginous-brown; vein streaks black. *Hindwing* fuliginous-brown basally, black posteriorly; discal white patch similar to male, except that the upper portion is broader and shorter, its two lower portions also shorter and not reaching inwardly to the base of the interspaces, the lowest portion being extended for some distance into the submedian interspace; the portion within apex of the cell is also absent; the submarginal lunules, edges of the angles, and tail spot being sullied pinkish-white. Underside similar to the upperside. *Hindwing* with the lunules a little brighter, and with a small white submarginal spot in the subcostal interspace.

Expanse, ♂ 5, ♀  $4\frac{3}{4}$  inches.

HABITAT.—N. Shan States; N. China Hills, Upper Burma.

DISTRIBUTION.—Described by de Nicéville from a single male captured by Major F. B. Longe, R.E., in the Kokang State, at 3500 feet elevation, in the North Shan States, on the Chinese frontier east of Bhamo, April 5th, 1895. A worn female in Mr. Walter Rothschild's collection, from which our description of this sex is taken, was caught by Capt. E. Y. Watson in the North Chin Hills, Upper Burma, at 5000 feet elevation. A male, taken by Col. C. T. Bingham at Bernardmyo, Shan States, Burma, is also in the British Museum.

Our illustration on Plate 429, fig. 2, is copied from Mr. de Nicéville's figure of the male.

**BYASA ADAMSONI** (Plate 431, fig. 1, 1a ♂, 1b ♀).

*Papilio Adamsoni*, Grose-Smith, Ann. & Mag. Nat. Hist. 1886, p. 149, ♂; *id.* Rhop. Exot. 1, *Pap.* pl. 5, fig. 3, 4 ♂ (1888). Rothschild, Nov. Zool. ii. p. 262 (1895). De Nicéville, Journ. Bombay N. H. Soc. 1899, p. 334.

*Papilio (Byasa) Minereoides*, Elwes, and de Nicéville, Journ. As. Soc. Bengal, 1887, p. 435, pl. 20, fig. 2, 2b ♂, 3 ♀.

IMAGO.—Male. Upperside. *Forewing* fuliginous-black, darkest basally; with a black longitudinal streak between the veins and others within the cell. *Hindwing* black, palest basally; with a lower-discal white patch composed of three portions placed in the interspaces between the lower median and radial veinlets, or this patch is pinkish-white and composed of five portions extending from the anal marginal angle to the interspace above the radial, the upper portion being either small and contiguous, or united to the submarginal lunular spot in the same interspace, and thus forming a transverse band crossed by black veins; beyond are three submarginal narrow lunules, the upper one being white or pinkish-white, the

other two crimson. Tail entirely black. Underside paler. *Hindwing* with the discal patch composed of five portions, the upper portion small or united to the submarginal lunule of the same interspace, the anal portions and the veins being crimson edged, the three lower lunules larger and brighter crimson; in the subcostal interspace, above the discal band, there is also a narrow or broad white lunule.

Female. Upperside. *Forewing* much paler; greyish-fuliginous. *Hindwing* greyish-fuliginous basally, black posteriorly; the discal patch and submarginal lunules white; the patch composed of five portions, the upper portion united to the submarginal lunule of the same interspace; tails black. Underside as in the male. *Hindwing* with the discal band white, as on the upperside. *Thorax* and abdomen above black; collar, front of head, sides of thorax beneath, and abdomen beneath, crimson; abdomen beneath with black segmental cross-bands; anal valves crimson; antennæ and legs black.

Expanse, ♂ ♀  $3\frac{1}{2}$  to 4 inches.

HABITAT.—Upper Tenasserim; Shan States, Burma.

DISTRIBUTION.—The type specimens were taken by Col. C. H. E. Adamson, Madras Staff Corps, near the Siamese frontier in January, 1880. Mr. J. Wood-Mason records "a male from Simbyoodine, and a pair from Ponselai, and a male in Major Marshall's collection taken in March, in the Thoungyeen forests, Upper Tenasserim" (*l.c.* p. 435). We possess males from Moulmein, and from Upper Mekong, Shan States, the latter taken by Mr. R. Roberts, C.E. "This species occurs apparently throughout Tenasserim, but is always rare. I have specimens from the Ataran Valley taken in March, the Thaungyin Valley taken in the same month, and the Daunat Range taken in January" (de Nicéville, J. Bombay N. H. S. 1899, 334).

**BYASA BOOTES** (Plate 432, figs. 1, 1a, ♂, 1b, ♀).

*Papilio Bootes*, Westwood, Ann. and Mag. Nat. Hist. 1842, p. 36; *id.* Arcana Ent. i. p. 123, pl. 31, ♂ (1843). Doubleday and Hewitson, Gen. D. Lep. i. p. 9 (1846). Gray, Catal. Lep. B. M. i. p. 15 (1852). Felder, Verh. Z. B. Ges. Wien. 1864, p. 325. Moore, Proc. Zool. Soc. Lond. 1867, p. 672. Rothschild, Nov. Zool. ii. p. 335 (1895).

*Byasa Bootes*, Swinhoe, Trans. Ent. Soc. Lond. 1893, p. 312.

IMAGO.—Male. Upperside. *Forewing* dark greyish fuliginous-black, blacker basally; with a black longitudinal streak between the veins and similar streaks within the cell; a few minute crimson scales generally present at base of the cell; cilia alternately edged with white. *Hindwing* more prolonged posteriorly than in *Janaka*; greyish fuliginous-black basally, deep black posteriorly; with a lower-discal white patch composed of two portions, the inner one, or both, very slightly

speckled with crimson scales posteriorly; in some specimens (from the same locality) a very small but much shorter similar spot is also present, and in others, again, an outer very small short rounded black-speckled white spot is occasionally also present; beyond are either two, more generally three, submarginal slender crimson lunules, the inner one being above the anal angle, followed by four corresponding outer-marginal broader and shorter crimson lunules, which latter are more or less white-speckled and with white cilia, the upper incisions of the wing also with white cilia; tail with duplex white spot. Underside. Somewhat paler. *Forewing* with a crimson patch at the base. *Hindwing* with a crimson basal patch, the lowest portion of which is short and restricted to the base of the median and submedian interspace; discal white patch as on the upperside; the submarginal and marginal crimson lunules larger and broader than on the upperside. *Thorax* and abdomen above black; front of thorax and collar, front of head, sides of thorax beneath, and abdomen beneath crimson; abdomen beneath with black lateral spots and segmental cross-bands; anal valves black, narrow and pointed at the apex; antennæ and legs black.

Female. Upperside somewhat paler than in male. *Hindwing* with the discal white patch composed of three portions and an upper very small rounded black-speckled spot; the submarginal crimson narrow lunules and marginal short lunules as in the male. Underside paler. *Hindwing* with markings as on the upperside.

Expanse, ♂ ♀  $4\frac{1}{2}$  to  $4\frac{3}{4}$  inches.

HABITAT.—Assam.

DISTRIBUTION.—Col. C. Swinhoe records it (*l.c.* p. 312) from “Shillong and Cherra Punji, Assam,” and has also since received numerous specimens from the Jaintia Hills.

**BYASA JANAKA** (Plate 433, figs. 1, 1a, ♂, 1b, ♀).

*Papilio Janaka*, Moore, Catal. Lep. Mus. E. I. Company, i. p. 97 (1857); *id.* Proc. Zool. Soc. Lond. 1857, p. 104, pl. 45, fig. 1, 1a, ♂. Felder, Verh. Z. B. Ges. Wien. 1864, p. 325. Elwes, Trans. Ent. Soc. Lond. 1888, p. 426. Haase, Untersuch. ub. Mim. p. 53, pl. 5, fig. 36, ♀ (1893). Rothschild, Nov. Zool. ii. p. 336 (1895).

*Papilio (Panosmiopsis) Janaka*, de Nicéville, Sikkim Gazetteer, 1894, p. 171.

*Papilio Sikkimensis*, Wood-Mason, Ann. and Mag. Nat. Hist. 1882, p. 103, ♂.

*Papilio (Panosmiopsis) Bootes*, Mackinnon and de Nicéville, Journ. Bombay N. H. Soc. 1898, p. 593.

IMAGO.—Male. Upperside. *Forewing* dark greyish fuliginous-black, with a black longitudinal streak between the veins, and others within the cell; a more or less apparent short dark crimson-scaled streak at base of the cell; cilia alternately edged with white. *Hindwing* olivescient greyish-fuliginous basally, deep black posteriorly; with a lower-discal white patch composed of three portions, which are

either fusiform in shape, or broadest at their lower ends, the inner portion being the shortest, and in some specimens an outer or upper fourth portion is also present, which latter is also small and more or less rounded and speckled with black scales, the three lower portions also being posteriorly edged with crimson scales; beyond are either four, or five, submarginal narrow crimson lunules, the upper one, when present, being almost white; below them are four marginal smaller crimson lunules edged with white cilia, the cilia of the upper incisions being also white; in some specimens the submarginal lunules are more or less obsolescent or partly obsolete; tail duplex-spot pale crimson or whitish, small, sometimes obsolescent.

Underside. Both wings paler. *Forewing* with a crimson patch at the base. *Hindwing* with a crimson basal patch and a continuous lengthened streak along the interspace between the median and submedian; the discal white patch as above, the two inner portions slightly speckled with crimson scales externally, or each is so speckled at both ends, and in some specimens the inner portion is entirely covered with crimson scales; the four lower submarginal crimson lunules and marginal lunules are prominent and broad, the anal pair being partly coalesced; two upper, or fifth and sixth, smaller white narrow lunules are generally present in the subcostal interspaces, and sometimes even a minute seventh in the costal interspace.

Female. Upperside somewhat paler. *Forewing* with a small crimson basal cell spot. *Hindwing* with the discal white patch composed of three nearly equal portions and a contiguous very small upper spot, the five submarginal and the lower marginal lunules duller coloured, the two upper submarginal lunules and the tail spot being almost or quite white. Underside as in the male.

Expanse, ♂ ♀  $4\frac{1}{2}$  to  $4\frac{3}{4}$  inches.

HABITAT.—N.-W. and E. Himalayas.

DISTRIBUTION.—Mr. P. W. Mackinnon found it "rare in Tehri Garhwal, N.-W. Himalaya, in May" (de Nicéville, J. Bombay N. H. Soc. 1898, 593). We possess specimens of both sexes from Garhwal. Mr. H. J. Elwes records it as "a rather rare species in Sikkim, where it is found at from 3000 to 5000 feet elevation, in May and June" (Tr. Ent. Soc. 1888, 426). Mr. W. Rothschild has several specimens from Sikkim" (Nov. Zool. ii. 326).

**BYASA PEMBERTONI** (Plate 434, fig. 1, ♂, 1b, ♀).

*Papilio Alcinous* (part), Moore, Catal. Lep. Mus. E. I. Compy. i. p. 95 (1857).

*Papilio Plutonium*, Elwes, Trans. Ent. Soc. Lond. 1888, p. 424 (*nec* Oberthür).

*Papilio* (? *Byasa*) *Plutonium*, de Nicéville, Sikkim Gazetteer, 1894, p. 171.

*Papilio Alcinous Plutonium* (part), Rothschild, Nov. Zool. ii. p. 271 (1895).

IMAGO.—Male. Upperside fuliginous-black; with black veins. *Forewing* with a black longitudinal streak between the veins and similar streaks within the cell.

*Hindwing* with five submarginal pale pinkish or flesh-colour broad lunular spots, each surrounded by black darker than the basal ground-colour. Underside paler, greyish fuliginous. *Forewing* as above. *Hindwing* with seven submarginal flesh-coloured lunular spots, all except the upper somewhat broader than those on the upperside.

Female. Upperside pale olivescent greyish-fuliginous. *Forewing* with black veins and streaks. *Hindwing* with the submarginal pale flesh-colour lunules slightly larger than in the male, and with their surrounding marginal borders dull dark black. Underside slightly paler than upperside. *Hindwing* with six submarginal pale flesh-colour lunules and a similar coloured broad anal lunule, as in male, the surrounding marginal border duller black. *Thorax* and abdomen above fuliginous-black; collar, front of head, sides of thorax beneath, and abdomen beneath pale crimson; segmental bands on abdomen beneath black; antennæ and legs black.

Expanse, ♂ ♀ 4 to 4 $\frac{1}{10}$  inches.

HABITAT.—Bhotan.

Described from two males, collected by Major R. B. Pemberton during his Mission to Bhotan in 1837-8, now in the British Museum collection, and from a female in Mr. W. Rothschild's Collection, labelled Chumbi? taken by Mr. Otto Möller's native collectors. Mr. H. J. Elwes has "two females, in bad condition, taken by his native collectors in the interior, probably from Bhotan, in 1884" (Tr. Ent. Soc. 1888, 424).

#### BYASA CRASSIPES (Plate 434, fig. 2, ♂).

*Papilio crassipes*, Oberthür, Etudes Ent. xvii., p. 2. pl. 4, fig. 38, 38a, ♂ (1893). Rothschild, Nov. Zool. ii. p. 262 (1895). Fruhstorfer, Soc. Ent. 1901, p. 113.

IMAGO.—Male. Upperside. *Forewing* dark fuliginous-black, with black veins, a longitudinal streak between the veins and streaks within the cell. *Hindwing* very narrow anteriorly and much prolonged posteriorly, exterior margin broadly scalloped, tail very broad and short; abdominal margin with a very long folded lappet, which when opened displays a lengthened greyish-white woolly androconial patch; colour dull greyish-black, with two upper marginal and two subanal lunules and tip of the tail very obscure dusky red. Underside. *Forewing* paler. *Hindwing* dull black, with the two upper and lower marginal lunules, an irregular-shaped anal lunule and the tail tip bright crimson. *Thorax* and abdomen above black; front of thorax and head, and abdomen beneath crimson; abdomen beneath with black segmental bands; hind tibiæ very thick; antennæ and legs black.

EXPANSE, ♂ 4 $\frac{1}{2}$  inches.

HABITAT.—Tonkin. Siam frontier, S. Shan States.

Our description and figure of this species is from a male in the possession of Mr. W. Rothschild, taken in the Nam Hla Valley, Siam frontier, S. Shan States, at 2500 feet elevation. Mr. H. Fruhstorfer (*l.c.*) records it from "Than-Moi, 1000 feet, Kalao, taken in May and June." The type specimen is stated to be from Tonkin.

CHINA AND JAPAN SPECIES.—*Byasa Lama* (*Papilio Lama*, Oberthür, *Etudes Ent.* ii. p. 15, pl. 3, fig. 1, ♀ (1876); *id.* iv. p. 43 (1879). *Pap. Philoxenus subsp. Lama*, Rothschild, *Nov. Zool.* ii. p. 266 (1895). *Leech, Butt. of China, Japan, &c.*, ii. p. 537 (1893). *Habitat.* W. and C. China.—*Byasa Alcinous* (*Papilio Alcinous*, Klug, *Neue Schmett. Ins. Samml. Berlin*, pl. 1, fig. ♂ ♀ (1836). *De Haan, Verh. Nat. Gesch. Ned.* p. 26—*nec. pl. 9, fig. larva* (1840). *De L'orza, Lep. Jap.* p. 11 (1869). *Pryer, Rhop. Nippon*, p. 4, pl. 5, fig. 3, ♀ (1886). *Leech, l.c.* p. 539 (1893). *Rothschild, l.c.* p. 267-8 (1895). *Syn. Pap. Spathatus*, *Butler, Ann. Nat. Hist.* 1881, p. 139. *Pap. hæmotostictus*, *Butler, l.c.* p. 140. *Habitat.* Japan.—*Byasa Mencius* (*Papilio Mencius*, *Felder, Wien. Ent. Mon.* vi. p. 22, ♂ ♀ (1862). *Pap. Alcinous subsp. Mencius*, *Rothschild, l.c.* p. 268. *Habitat.* China.—*Byasa Plutonium* (*Papilio Plutonium*, *Oberthür, Etud. Ent.* ii. p. 16, pl. 3, fig 2, ♂ (1876). *Leech, l.c.* p. 541 (1893). *Pap. Alcinous subsp. Plutonium*, *Rothschild, l.c.* p. 271. *Habitat.* W. China.—*Byasa Loochooana* (*Pap. Alcinous Loochooana*, *Rothschild, l.c.* iii. p. 421 (1896). *Habitat.* Okinawa, Loo Choo Islands.—*Byasa Mansonensis* (*Pap. Alcinous Mansonensis*, *Fruhstorfer, Soc. Ent.* 1901, p. 113. *Habitat.* N. Tonkin.—*Byasa Nigricans* (*Pap. Bootes subsp. Nigricans*, *Rothschild, l.c.* ii. p. 335, ♂ (1895). *Pap. Bootes*, *Leech, l.c.* p. 551 (1893). *Habitat.* W. China.—*Byasa dealbata* (*Pap. Janaka subsp. dealbatus*, *Rothschild, l.c.* ii. p. 336, ♂ (1895). *Habitat.* W. China.

### Genus TROS.

*Tros*, *Barbutt, Genera Ins. Linné*, p. 168 (1781). *Kirby, Allen's Nat. Hist. Butt.* ii. p. 305 (1896).

*Papilio* (part), *Doubleday and Hewitson, Gen. D. Lep.* i. p. 5 (1846).

*Menelaides* (part), *Hübner, Verz. bek. Schmett.* p. 84 (1816).

*Papilio* (group I. part), *Rothschild, Nov. Zool.* ii. p. 233 (1895).

IMAGO.—Male. *Forewing* elongate, triangular; apex convex, exterior margin very oblique and slightly waved, posterior margin short and almost straight; cell very long. *Hindwing* short anteriorly, produced posteriorly, exterior margin scalloped and with a narrow tail at end of upper median veinlet; abdominal margin not folded; basal area from the costa to below the median vein and its branches, thickly clothed with fine long hairs. *Body* moderately stout; apex of abdomen without valves; posterior tibia not incrassated, clothed with fine short spiny scales; antennæ with a gradually thickened club.

LARVA.—Cylindrical, tapering towards each end; with a subdorsal and two



lateral rows of fleshy cylindrical tubercles, the lowest rows shortest; an additional lateral tubercle on 3rd and 4th segment.

**PUPA.**—Head truncate in front; thorax dorsally conical and laterally rounded; wing-cases posteriorly rounded and dilated; abdominal segments with four subdorsal short foliaceous protuberances.

**TYPE.**—T. Hector.

**TROS HECTOR** (Plate 435, fig. 1, *larva* and *pupa*, 1a, ♂, 1b, ♀).

*Papilio Hector*, Linnæus, Syst. Nat. ed. x. p. 459 (1758); *id.* Mus. Ulr. p. 183 (1764); Syst. Nat. ed. xii. p. 745 (1767). Clerck, Icon. Ins. ii. pl. 33, fig. 1 (1764). Fabricius, Syst. Ent. p. 443, (1775). Sulzer, Gesch. Ins. p. 141, pl. 12, fig. 1 (1776). Cramer, Pap. Exot. ii. p. 67, pl. 141, fig. A ♂ (1777). Fabr. Spec. Ins. ii. p. 2 (1781); *id.* Ent. Syst. iii. 1, p. 3 (1793). Esper, Ausl. Schmett. p. 15, pl. i. fig. 2 (1784); *id.* p. 246, pl. 40, fig. 2, 3 (1798). Jablonsky, Nat. Schmett. ii. p. 137, pl. 13, fig. 2 (1784). Godart, Encyc. Meth. ix. p. 70 (1819). Lucas, Lep. Exot. p. 8, pl. 4, fig. 2 (1835). Boisduval, Spec. Gen. Lep. i. p. 269 (1836). De Haan, Verh. Nat. Gesch. Ned. p. 39 (1840). Westwood, Arc. Entom. i. p. 9, pl. 3, figs. 1—4 (1845). Doubleday and Hewitson, Gen. D. Lep. i. p. 9 (1846). Gray, Catal. Lep. B.M. i. p. 11 (1852). Chenu, Enc. d'Hist. Nat. pl. 5, fig. 1 (1851). Moore, Catal. Lep. Mus. E.I.C. i. p. 93, pl. 2, fig. 4, 4a, b, *larva* and *pupa* ((1857). Felder, Verh. Z. B. Ges. Wien. 1864, pp. 326, 375. Moore, Proc. Zool. Soc. Lond. 1865, p. 756. Butler, Catal. Fabr. Lep. B.M. p. 258 (1869). Oberthür, Etud. Ent. iv. p. 44 (1879). Staudinger, Exot. Schmett. i. p. 6, pl. 3, ♂ (1884). Rothschild, Nov. Zool. ii. p. 223 (1895).

*Tros Hector*, Barbut, Gen. Ins. Linné, p. 168, pl. 10, fig. 2 (1781). Kirby, Allen's Nat. Hist. Butt. ii. p. 305 (1896).

*Princeps Heroicus Hector*, Hübner, Samml. Exot. Schmett. i. pl. 110, fig. 1, 2 (1806—19).

*Menclaides Hector*, Hübner, Verz. bek. Schmett. p. 84 (1816). Moore, Lep. of Ceylon, i. p. 152, pl. 58, fig. 2 (1881). Swinhoe, Proc. Zool. Soc. Lond. 1885, p. 142.

*Ærnavta Hector*, Berge, Schmett. p. 108, pl. 37, fig. 1, ♂ (1842).

*Papilio (Menclaides) Hector*, de Nicéville, Journ. As. Soc. Bengal, 1885, p. 52. Hampson, *ib.* 1888, p. 363.

**IMAGO.**—Male. Upperside. *Forewing* bluish-black; with an outwardly-oblique transverse medial interrupted band composed of white or ochreous-white short indented streaks, and three, sometimes four, similar-coloured subapical streaks, the latter series being occasionally continued to the discal band by means of white discal linear marks between the radial and upper median veinlet; cilia alternated with white. *Hindwing* richer bluish-black; the basal area densely clothed with fine silky brownish hairs; a discal transverse curved series of seven bright crimson spots, the last one being at the anal angle, and of which the three lower discal are the smallest and sometimes very small; followed by a submarginal row of bright crimson lunules; in some specimens all these spots are of a duller and paler crimson; cilia alternated with white. *Thorax* and base of abdomen, legs and antennæ black; front

of head, palpi, collar, sides of thorax beneath, and anal half of abdomen crimson; sides of abdomen with a row of black dots.

Female. Upperside somewhat paler. *Forewing* with the transverse interrupted bands ochreous-white. *Hindwing* with the discal series of spots much paler and somewhat ochraceous, and the sub-marginal lunules paler and duller crimson. Under-side as in the male.

Expanse, ♂  $3\frac{1}{2}$  to  $4\frac{1}{2}$ , ♀  $4\frac{1}{4}$  to  $4\frac{3}{4}$  inches.

LARVA.—Cylindrical, tapering slightly towards each end; rich dark purple-brown; with a sub-dorsal and two lateral rows of crimson fleshy cylindrical tubercles, the lowest row shortest, and an additional lateral tubercle on the third and fourth segment; a transverse row of four pinkish-white spots on the seventh and eighth segment; head and legs blackish.

PUPA.—Head truncate in front; thorax dorsally conical and laterally rounded; wing-cases posteriorly rounded and dilated; abdominal segments with four subdorsal short foliaceous protuberances; colour pale violaceous-ochreous.

HABITAT.—Lower India (Central Provinces, Bombay, Madras); Ceylon; Calcutta; Chittagong.

DISTRIBUTION.—This butterfly has a rather restricted range. Mr. W. Rothschild cites specimens from the "Central Provinces" (*l.c.* 234). Col. C. Swinhoe obtained it at "Poona, Bombay, in March and June; at Belgaum in October, and in Bombay in July, September, and October" (*P. Z. S.* 1885, 145). Mr. J. Davidson and E. H. Aitken (*J. Bombay N. H. S.* 1890, 362) say, "larvæ were found, in Bombay, throughout the monsoon, and once in April, on a plant near water, which had retained some green leaves. In June, when they first appeared, it was difficult to get food for them, as the young shoots of *Aristolochia* had scarcely begun to sprout. The egg must have been laid on the dry stalks of last season." "The butterfly is very common, in the Kanara District of Bombay, at the same time as *Ornith. Minos*, but it is of course more plentiful at all seasons" (*ib. l.c.* 1896, 577). Mr. S. N. Ward (*MS. Notes*) records it as "common all over the Peninsula, and is, I think, the commonest species of its tribe, which may be accounted for by its frequenting low flowering shrubs and herbs, such as grow by the road side. It is found on the Hills, both Nilghiri and Shevaroy, though not so commonly as lower down. It lasts from May to September. Its larva feeds upon *Aristolochia indica*. Its changes occupy ten days or a fortnight." Mr. R. S. Eaton observed that "in the Bombay Presidency, during the latter part of the rains (Sept.—Dec.) in the beginning of the cold weather, this butterfly commonly roosts in flocks. About sunset they betake themselves to trees—usually the 'Babul,' a species of *Acacia*—clinging to the underside of the subpendulous branches towards their extremities in crowds of many hundreds; and there they rest until the

sun is well up" (Ent. Mo. Mag. 1880, 276). Mr. G. F. Hampson obtained it on the "Nilgiris at from 1000 to 7000 feet elevation" (J. As. Soc. Bengal, 1888, 363). Sir W. Elliot "found and reared the larva on *Aristolochia*, in October, at Simachellum, Madras" (MS. Notes). Capt. E. Y. Watson records it as very common in Madras from June to September" (J. As. Soc. Bengal, 1890, 268). Common at Kolar in October, and at Nelamangala, Mysore, in January" (*id.* J. Bombay N. H. S. 1890, 9). Mr. H. S. Ferguson records it as "very common in Travancore, both in low country and on the lower slopes of the Hills" (*ib.* 1891, 446). Mr. J. Rothney found it "common in Barrackpore Park, near Calcutta, from March to October" (Ent. Mo. Mag. 1882, 73). Mr. L. de Nicéville says it is "rare in Calcutta, but taken commonly at Chandernagore in November. Has a strong scent. Larva feeds on *Aristolochia*" (J. As. Soc. Bengal, 1885, 52). Mr. W. C. Taylor records it as "common at Khorda in Orissa" (List 1888, 16). We possess a male taken in Chittagong, in September. In Ceylon, it is "common in the low country at certain seasons of the year, generally after the first outbreak of the two monsoons. It is abundant at Colombo" (Dr. N. Manders, J. As. Soc. Beng. 1899, 221). Col. J. W. Yerbury took it at Trincomali in September. Mr. F. M. Mackwood records it as a "low country butterfly in Ceylon, and found occasionally about 2000 feet elevation. Very abundant in the early months of the year, but occurs all through the year" (Lep. Ceylon, i. 152).

Of our illustrations on Plate 435, fig. 1, larvæ and pupæ are from Sir W. Elliot's Madras drawings, and fig. 1a, b, the male and female.

#### Genus MENELAIDES.

*Menelaides*, Hübner, Verz. bek. Schmett. p. 84 (1816). Moore, Lep. of Ceylon, i. p. 151 (1881).

Kirby, Allen's Nat. Hist. Butt. ii. p. 304 (1896).

*Papilio* (part), Doubleday and Hewitson, Gen. D. Lep. i. p. 5 (1846).

*Papilio* (Group I. part), Rothschild, Nov. Zool. ii. p. 233 (1895).

IMAGO.—Male. *Forewing* elongated, somewhat narrow, triangulated; apex very convex, exterior margin long and oblique, posterior margin short; cell long and narrow, extending to two-thirds the wing; first subcostal branch emitted at two-fifths and second at one-fifth before the end of the cell; upper discocellular shortest. *Hindwing* very short anteriorly, narrow, produced posteriorly; exterior margin scalloped and furnished with a more or less developed tail; abdominal margin slightly folded and grooved alongside of the submedian vein; cell short, broadest across the middle; first subcostal emitted at one-fourth before end of the cell; upper discocellular very long and oblique, twice the length of the lower. *Body* moderately slender, anal segment not valved; posterior tibia thickly incrassated from

near base to the tip, and densely clothed with rather long lax spiny scales; antennal club gradually thickened.

TYPE.—*M. Polydorus*, Linn.

**MENELAIDES JOPHON** (Plate 436, fig. 1 *larva*, 1a, ♂, 1 b, ♀).

*Papilio Jophon*, Gray, Catal. Lep. Brit. Mus. i. p. 10, pl. 4, fig. 4 ♀ (1852); *id.* List. Lep. B. M. p. 11 (1856). Felder, Verh. Z. B. Ges. Wien. p. 326 (1864). Haase, Untersuch. ub. Mim. p. 24 (1893). Rothschild, Nov. Zool. ii. p. 234 (1895).

*Menelaides Jophon*, Moore, Lep. of Ceylon, i. p. 152, pl. 58, fig. 1 ♀ (1881); *ib.* ii. p. 533, pl. 210, fig. 6, *larva*.

IMAGO.—Male. Upperside rich violescent brownish-black. *Forewing* with a sullied greyish-white short forked streak between the outer veins, those above the third median veinlet slender, those below very broad, less forked, and prominent; within the cell are four short similar coloured narrow streaks, the upper one obsolescent, which are superposed above the interspace of the lower medians. *Hindwing* with a large sullied-white central rounded patch extending across outer-half of the cell and the basal interspaces from the upper subcostal to the submedian vein; beyond is a submarginal series of five ill-defined narrow black-speckled dusky crimson lunules. Underside. *Forewing* paler violescent-brown, the streaks whiter and more prominent. *Hindwing* with the central white patch more prominent and with an upper small white spot present in the costal interspace; followed by a submarginal series of six crimson lunules and a crimson lunule at anal angle. *Thorax* and abdomen above and beneath to near the tip, black; collar behind the eyes edged with white; frontal tuft brown; palpi dull pale crimson; sides of thorax beneath, tip and sides of abdomen above and beneath crimson, the latter with black lateral spots and segmental bands; antennæ and legs black.

Female. Upperside. *Forewing* broader; vein and cell streaks as in the male, more prominent and whiter. *Hindwing* as in the male, with the central patch whiter; the elongated streak in the submedian interspace slightly tipt with pale crimson scales. Underside as in the male.

Expanse, ♂  $4\frac{1}{2}$ , ♀  $4\frac{3}{4}$  to 5 inches.

LARVA.—“Dark purple-black, with crimson coloured pointed tubercles, two on 2nd segment, eight on each of 3rd and 6th, six on each of 8th to 10th, and four on 13th; seventh segment with a pale cream-coloured transverse band (interrupted on the dorsal line) including four tubercles of the same colour, below which on each side is a single crimson tubercle; on second segment is a band composed of four pale tubercular-spots, from the centre of which can be protruded a pair of short blunt yellow tentacles.”

EGG.—“Tawny; globular, ribbed, with a small point at the apex.” (E. E. Green, MS. Note.)

HABITAT.—Ceylon.

DISTRIBUTION.—“Peculiar to Ceylon, and confined locally to the middle hill-district. It is not rare at Pundaloya and Gampola in June, and is easily captured in the early morning; after the sun is up it flies fast and soars over the tops of the forest trees quite out of reach” (Dr. N. Manders, Journ. As. Soc. Bengal, 1899, 221). Mr. F. M. Mackwood records it as “very local. Hills from 2000 to 4000 feet elevation. Taken only in the Navalputha and Pusilawa country in a tract of about twenty miles in extent, in June.” Capt. Wade obtained it “at Ambagamma; Kollawah forest. Rather plentiful, but very difficult to capture, being a high flier” (Lep. Ceylon, i. 152).

Of our illustrations on Plate 436, fig. 1 is from a drawing of the larva by Mr. E. Ernest Green, and figs. 1a, b, are of male and female.

**MENELAIDES PANDIYANA** (Plate 437, fig. 1, 1a, ♂, 1b, ♀).

*Papilio Pandiyana*, Moore, Trans. Ent. Soc. Lond. 1881, p. 313.

*Papilio (Menelaides) Pandiana*, Hampson, Journ. As. Soc. Bengal, 1888, p. 363.

*Papilio (Menelaides) Pandiyana*, Ferguson, Journ. Bombay N. H. Soc. 1891, p. 446.

*Papilio Pandianus*, Rothschild, Nov. Zool. ii. p. 234 (1895).

IMAGO.—Male. Allied to *Jophon*. *Forewing* narrower. Upperside with the pale streaks between the outer veins longer and with a linear intervening black streak, the upper cell-streaks extending to the end; a short whitish streak also present below the submedian vein. *Hindwing* with the cell longer, the discal sullied-white patch extending from two-thirds before end of the cell and there traversed within by two longitudinal slender obscure blackish lines, the portions in the outer interspaces being broader and shorter, and with an upper large quadrate spot in the costal interspace; six submarginal obscure dusky crimson lunules, and one at the anal angle. Underside. *Forewing* paler; vein streaks paler. *Hindwing* with the discal patch, as on upperside, whiter; the six submarginal lunules and the anal lunule prominent, broad, pure pink. *Thorax* and abdomen black, tip of abdomen ochreous; frontal tuft and palpi pale ochreous.

Female. Upperside similar to the male. *Hindwing* with the outer portions of the discal whitish patch externally speckled with dusky scales, the upper or costal portion is small or divided into two; the submarginal lunules and anal lunule somewhat broader. Underside similar to the upper, the streaks on forewing and discal patch on hindwing whiter, the submarginal lunules and anal lunule as in the male.

Expanse, ♂ 4, ♀ 4 $\frac{1}{4}$  inches.

LARVA.—Unknown.

HABITAT.—S. India; Travancore, Nilgiris.

DISTRIBUTION.—“This is a South India butterfly, and is perhaps little more than a straggler in the N. Kanara District of Bombay, but there are one or two places on the ascent of the Ghâts where it is not uncommon. The larva remains to be discovered. It probably feeds on *Rutaceæ*, as we once saw a female fluttering about in the underwood among plants of that Order. It has the flight of *Aristolochia*, and has the same habit of hovering about flowers in the early mornings. The imago is never found far from evergreen jungle” (J. Davidson and E. H. Aitken, J. Bombay N. H. S. 1896, 584). Mr. G. F. Hampson says that, on the Nilgiris, it is “confined to the Western Slopes, from 1000 to 3000 feet elevation, where it is common” (J. As. Soc. Beng. 1888, 363). It is “abundant in the Travancore Hills at about 2000 feet elevation. Found also in the low country at the foot of the Hills” (H. S. Ferguson, J. Bombay N. H. S. 1891, 446).

#### MENELAIDES ARISTOLOCHIÆ.

*Dry-season form* (Plate 441, fig. 1, larva and pupa; 1a, ♂, 1b, ♀; 1c, ♂, 1d, ♀).

- Papilio Aristolochiæ*, Fabricius, Syst. Ent. p. 443 (1775). Goeze, Ent. Beyt. iii. 1, p. 40 (1779).  
 Butler, Catal. Fabr. Lep. B. M. p. 258 (1869). Moore, Proc. Zool. Soc. Lond. 1878, p. 840.  
 Oberthür, Etudes Ent. iv. p. 43 (1879); *id.* xvii. p. 3 (1893). Elwes, Tr. Ent. Soc. Lond. 1888, p. 427. Manders, *ib.* 1890, p. 535. Davidson and Aitken, Journ. Bombay N. H. Soc. 1890, p. 362. Leech, Butt. of China, ii. p. 554 (1893). Rothschild, Nov. Zool. ii. p. 245 (1895).
- Menelaides Aristolochiæ*, Moore, Proc. Zool. Soc. Lond. 1882, p. 259. Swinhoe, Tr. Ent. Soc. Lond. 1893, p. 313.
- Papilio (Menelaides) Aristolochiæ*, de Nicéville, Journ. As. Soc. Bengal, 1885, p. 52. Doherty, *ib.* 1886, p. 137. Wood-Mason and de Nicéville, *ib.* 1886, p. 376. Elwes and de Nicéville, *ib.* 1886, p. 435. Hampson, *ib.* 1888, p. 363. Ferguson, Journ. Bombay N. H. Soc. 1891, p. 446. de Nicéville, Sikkim Gazetteer, 1894, p. 171.
- Papilio Polidorus*, Cramer, Pap. Exot. ii. p. 45, pl. 128, fig. A, B (1777), *nec* Linné.
- Papilio Polydorus*, Jablonsky, Nat. Schmett. ii. p. 201, pl. 15, fig. 3 (1784).
- Princeps Heroicus Polydorus*, Hübner, Samml. Exot. Schmett. i. pl. 111 (1806-19).
- Papilio Polydorus* (part), Hübner, Verz. bek. Schmett. p. 84 (1816).
- Papilio Polydorus*, Horsfield, Catal. Lep. Mus. E. I. Company, pl. 3, fig. 17, larva (1828). De Haan, Verh. Nat. Gesch. Ned. p. 38, pl. 8, fig. 1 (1840).
- Papilio Hector* (part), Fabricius, Spec. Ins. ii. p. 2 (1781). Jablonsky, Nat. Schmett. ii. p. 201 (1784). Esper, Ausl. Schmett. p. 15 (1784).
- Papilio Diphilus*, Esper, Ausl. Schmett. p. 156, pl. 40, fig. 2 (1792). Gray, Catal. Lep. B. M. 1, p. 10 (1852). Moore, Catal. Lep. Mus. E. I. Company, i. p. 94, pl. 2, fig. 5, 5a, larva (1857). Felder, Verh. Z. B. Ges. Wien. 1864, p. 326. Lang, Ent. Mo. Mag. 1864, p. 101. Wallace,

Trans. Linn. Soc. Lond. 1865, p. 43. Moore, Proc. Zool. Soc. Lond. 1865, p. 756; *ib.* 1866, p. 356. Druce, *ib.* 1874, p. 109. Butler, Trans. Linn. Soc. Zool. 1877, p. 553.

*Aërnauta Diphilus*, Berge, Schmett. p. 108, pl. 36, fig. 1, ♀ (1842).

*Papilio (Menelaides) Diphilus*, Swinhoe, Proc. Zool. Soc. Lond. 1884, p. 512.

*Papilio Aristolochia*, var. *Diphilus*, Distant, Rhop. Malayana, p. 337, pl. 31, fig. 6, 7 (1885).

*Menelaides Diphilus*, Swinhoe, Proc. Zool. Soc. Lond. 1885, p. 145, *ib.* 1886, p. 433. Moore, Journ. Linn. Soc. Zool. 1886, p. 51.

*Papilio Adamas*, Zinken-Sommer, Nova Acta Acad. Cur. xv. p. 144 (1831).

*Polydorus Thoas*, Swainson, Zool. Illustr. ii. pl. 100, ♂ (1833).

IMAGO.—Male. Upperside black or fuliginous-black; cilia fuliginous. *Forewing* with pale fuliginous or greyish-fuliginous streaks bordering the outer veins, these streaks terminating uniformly at some distance before the exterior margin; similar pale short streaks also extending from within end of the cell. *Hindwing* with a lower-discal series of three, or four, white or ochreous-white spots, which are usually small and short and disposed in a curve at some distance beyond end of the cell; at the anal angle between the lower median and submedian is a contiguous more or less irregular-shaped spot, this latter spot being more or less elongatedly-ocellate with a black centre and of a sullied-white or crimson colour, or is whitish anteriorly and crimson posteriorly; beyond is a submarginal series of five dusky-scaled lunules, which are either dull or bright crimson and sometimes dull ochreous. Underside. *Forewing* duller fuliginous-black; the vein-streaks much paler. *Hindwing* intense black; the discal white spots as on upperside, and with six submarginal pale or bright crimson spots larger and broader than on upperside, the upper spot being placed in the costal interspace; the anal spot also bright crimson. *Thorax* and abdomen above black; front of head, palpi, collar, sides of thorax beneath and abdomen bright crimson; abdomen beneath with black segmental bands; antennæ and legs black.

Female. Upperside duller coloured. *Forewing* olivescient fuliginous-black; the vein-streaks less prominent and duller fuliginous. *Hindwing* olivescient-fuliginous basally, black externally; the discal white spots, positioned as in the male, are similar in shape but somewhat larger and broader; the submarginal lunules also larger, paler and duller coloured. Underside similar to the male.

Expanse, ♂ ♀ 3 to 4 inches.

*Wet-season form* (Plate 442, fig. 1, ♂, 1a, ♀, 1b, ♂, 1c, ♀).

*Menelaides Ceylonica*, Moore, Lep. of Ceylon, i. p. 151, pl. 57, fig. 2, ♂, 2a, b, *larva* and *pupa* (1881).

*Papilio Diphilus*, var. C. Gray, Catal. Lep. B. M. i. p. 10.

Male. Upperside brighter and darker coloured than in the dry-season form. *Forewing* with the vein-streaks broader and paler. *Hindwing* with the discal series of white spots elongated and extending from outer edge of the cell, the upper one

being generally the smallest or the shortest, these spots thus forming a more or less large discal patch, and in some specimens a small dentated spot is contiguously situated within the end of the cell; the contiguous anal irregular-shaped spot is more elongated. Underside. *Forewing* duller black; the vein-streaks pale fuliginous-grey and broader. *Hindwing* with the discal white spots as on upperside; the six submarginal spots and posterior portion of the anal spot bright crimson.

Female. Upperside. Ground-colour similar to the dry-season form. *Forewing* with the vein-streaks paler. *Hindwing* with the discal white spots as in the male; the submarginal lunules broader and paler. Underside similar to the male.

Expanse, ♂ ♀ 3 to 4 inches.

LARVA.—“Adult  $1\frac{1}{4}$  inch long. Stout, cylindrical and tuberculous. Ground-colour velvet brown-black; dorsal line black; four longitudinal rows of fleshy tubercles bright red at the apex and velvety at the base; a similar lateral row of tubercles on anterior segments; on seventh segment a milk-white jagged lacerated band reaching right across the body and terminating at the third row of tubercles; the tubercles on that segment are white with the exception of the third and fourth row; head black; segmental incisions dark purple-brown; legs and abdomen beneath black; stigmata black; retractile tentacula orange. Feeds on *Aristolochia indica*. Habits slow.”

PUPA.—“August 29th; darkish-brown; stout and broad, swollen at the sides; with four pairs of very prominent protuberances on the back of abdomen. Imago emerged September 10th” (Capt. H. L. Chaumette, Lucknow, MS. Notes).

HABITAT.—North Western, Eastern, and Continental India; Ceylon; Burma; Tenasserim; Siam; Malay Peninsula; Nicobars; Java; Formosa; W. China.

HISTORICAL NOTE.—Mr. L. de Nicéville remarks, “the food plant of this butterfly (*Aristolochia*) must have been known to Fabricius in Europe in 1775, when he described the insect, and probably named it after the pabulum of the larva” (J. A. S. Beng. 1900, 257).

DISTRIBUTION AND HABITS.—In North-Western India it is recorded by Mr. P. W. Mackinnon as being “found rarely in the Dehra Dun in April and October” (J. Bombay N. H. S. 1898, 591). Mr. W. Doherty took it “at Ranibagh and Haldwani at the foot of the Hills, Kumaon” (J. A. S. Bengal, 1886, 137). Capt. A. M. Lang says, “Not observed in the North-West Himalayas. It occurs in Oudh, and rare at Umballa” (Ent. Mo. Mag. 1864, 101). Capt. H. L. Chaumette found and reared the larva in Lucknow in 1861, feeding on *Aristolochia indica*, the description of which, from his MS. Notes, is given above. The larvæ were found in August, changed to pupæ on the 29th, and the imago emerging on September 10th. The butterfly is found on the wing in Lucknow from April to October, but is not common. It is fond of flying amongst the orange and lime groves, the thorns of which continually destroy



the delicate tails. Its flight is slow and heavy." "Not a very common species at Saugor, but by no means rare." Major H. B. Hellard took it at Allahabad, N.W. India. We possess specimens of both dry and wet forms from Maupuri, N.W. Provinces, taken by the late Mr. C. Horne, and a female (dry-form) taken at Akote, Central India, in February. Col. C. Swinhoe took it at Dudhi and Shahgunge, Mirzapur, N. W. Prov. in February," and also records it as "plentiful in Karachi in July and August" (P. Z. S. 1884, 512). We possess *both forms* from Karachi, taken in August, and the *dry form* from Kattywar and Sind. Proceeding Southward, Col. Swinhoe found it "common in Mhow, from September to March" (P. Z. S. 1886, 433); also "common everywhere in Bombay and the Dekhan from October to June; varying much in size and markings, some of the males taken in the cold weather at Ahmednuggur being very small and measuring less than three inches in expanse of the wings" (*ib.* P. Z. S. 1885, 145). Mr. J. Davidson and E. H. Aitken "reared the larva in Kanara during the rains. In the Dekhan, where it is much commoner, it feeds on *Aristolochia bracteata*, a feeble plant with bluish-green leaves, that trails on black soil" (J. Bombay N. H. S. 1890, 362). "It is even commoner in the Kanara district than *P. Hector*. As late as January we have seen a mangoe tree in bloom literally alive with them at an early hour in the morning. Both this species and *P. Hector* travel much" (*ib. l.c.* 1896, 577). Mr. G. F. Hampson took it on the Nilgiris at from 1000 to 7000 feet" (J. A. Soc. Beng. 1888, 363). Capt. E. Y. Watson found it "not very common in Madras from March to June" (J. A. S. Beng. 1890, 268). Sir W. Elliot reared the larva, in Madras, on *A. bracteata*, in August. "A few were taken at Sagar and Kathlekan, Mysore, in January" (*ib.* J. Bombay N. H. S. 1890, 9). Mr. H. S. Ferguson records it as common in Travancore, in the low country and the Hills" (*l.c.* 1891, 446). In Ceylon Mr. F. M. Mackwood records it as occurring "all the year round; in low country, and hills up to about 4000 feet elevation. Occasionally a few occur in the highest range" (Lep. Ceyl. i. 151). Dr. N. Manders also found it "an abundant species in Ceylon, especially so in the low country" (J. As. S. Beng. 1899, 221). Proceeding N.-Eastward, Mr W. C. Taylor says it is "very common at Khorda, in Orissa" (List, p. 16). Mr. J. Rothney found it "very common in Barrackpur Park near Calcutta, from March to October" (Ent. Mo. Mag. 1882, 73). Mr. L. de Nicéville says it is "very common in the neighbourhood of Calcutta, where it is commonly called the "rose butterfly," in consequence of its strong scent; the larva feeds on *Aristolochia*" (J. As. Soc. Beng. 1885, 52). We possess both sexes of the *dry-season* form from Calcutta. Col. C. Swinhoe records it from the Khasias (Tr. Ent. Soc. 1893, 313). Mr. J. Wood-Mason took "twenty males and four females at Silcuri, Cachar, in May and August" (J. As. Soc. Beng. 1886, 376). Mr. H. J. Elwes records it as "common in Sikkim up to 2000 or 3000 feet elevation, from April to December"

(Tr. Ent. Soc. 1888, 427). Mr. L. de Nicéville says it is "an insect of the plains, but occurs in the lower valleys of Sikkim throughout the warm months" (Sikkim Gaz. 1894, 171). Mr. W. Rothschild has a male *dry-form* taken in September, and both sexes of the *wet-form* taken in Sikkim, in April and October, by Mr. Müller. Mr. G. C. Dungeon took it at Buxa, in Bhotan. In Burma "it is very abundant, especially near the sandy beds of streams, throughout the year; the females are as plentiful as the males, and frequent the same places" (Col. C. H. E. Adamson, List, 1897, 47). Commander A. Carpenter obtained it "at Sheemagar and Kyouk-Myoung, Upper Burma, in December" (Ann. N. H. 1886, 189). It is very common in the Shan States, but is not found, I think, above 5000 feet" (Dr. N. Manders, Tr. Ent. Soc. 1890, 535). Mr. Ossian Limborg records it from "Moulmein to Meetan, Hatseiga, and from Naththoung to Paboga," Upper Tenasserim (P. Z. S. 1878, 840). Signor L. Fea obtained it at Kokaret and Meetan in May, and at Meteleo, Karen Hills, in August. Mr. H. J. Elwes records "many males and females from Tavoy, Ponsekai, and the Hills" (J. As. S. Beng. 1886, 435). We possess a male of the *dry-form*, taken in Chittagong, in November, and both sexes of the *wet-form* from Burma, showing the white spot within apex of the cell. We also possess two males from Mr. F. de Roepstorff's Collection, labelled "Car Nicobar" and "Pulo Condul," which agree with Ceylon *wet-form* in having the white spot within apex of the cell, and a female, also labelled "Car Nicobar," without the cell spot.

It also is found in Siam; we have it from the Malay Peninsula, Java, and Formosa. It occurs also in W. China.

**MENELAIDES CAMORTA** (Plate 443, fig. 1, 1a, ♂, 1b, c, ♀).

*Papilio Aristolochiæ*, var. *Camorta*, Moore, Proc. Zool. Soc. Lond. 1877, p. 592, ♀. Wood-Mason and de Nicéville, Journ. As. Soc. Bengal, 1881, p. 237; *ib.* 1882, p. 18. Rothschild, Nov. Zool. ii. p. 250 (1895).

IMAGO.—Male. Upperside. Differs from the dry-season form of *Aristolochiæ*, on the hindwing, in having one small short white discal spot, and sometimes two other more or less obsolescent small black-speckled spots, each disposed at the base of the interspace of the medians, and an upward elongation of the red anal spot. Underside. *Hindwing* with three small short white spots disposed in the basal interspace of the medians, and also a small white dentate-spot within apex of the cell, the two outer spots and the cell spot being slightly black-scaled. The anal crimson spot elongated.

Female. Upperside. *Hindwing* with a small white-speckled spot only present, in the basal interspace of the lower medians; the elongated anal spot paler. Underside as in the male, the cell spot less apparent or obsolete.

Expanse, ♂  $3\frac{1}{2}$  to  $4\frac{1}{2}$ , ♀  $4\frac{1}{2}$  to  $4\frac{3}{4}$  inches.

HABITAT.—Camorta, Nancowry, Nicobar Isles.

The type specimen of this butterfly was taken on Camorta Island by Mr. R. Meldola, in April. Others, of both sexes, were since received from Mr. F. de Roepstorff, taken at Camorta and Nancowry.

INDO-MALAYAN SPECIES.—*Menelaides Annæ* (Papilio Annæ, Felder, Wien. Ent. Mon. v. p. 297, ♂ (1861); *id.* Reise Nov. Lep. i. p. 132, pl. 20, fig. c, ♀ (1865). Rothschild, Nov. Zool. ii. p. 243 (1895). Pap. (Men.) Annæ, Semper, Philipp. Tagfalt. p. 271, pl. 46, fig. 2 ♀ (1891). *Habitat.* Mindoro, Philippines.—*Menelaides Phlegon* (Pap. Phlegon, Felder, Verh. Z. B. Ges. Wien. 1864, p. 326, ♀. Pap. (Men.) Phlegon, Semper, *l.c.* p. 271, pl. 46, fig. 3 ♂ (1891). Pap. Annæ *subsp.* Phlegon, Rothschild, *l.c.* p. 243 (1895). *Habitat.* S. W. Mindanao.—*Menelaides Mariæ* (Pap. Mariæ, Semper, Verh. Ver. Nat. Hamburg, iii. p. 115 (1878). Oberthür, Etud. Ent. iv. p. 44 (1879). Rothschild, *l.c.* p. 244 (1895). Pap. (Men.) Mariæ, Semper, *l.c.* p. 270, pl. 46, fig. 5, ♂ (1891). *Habitat.* Bohol; Cebu; Mindanao.—*Menelaides Almæ* (Pap. (Men.) Almæ, Semper, Phil. Tagfalt. p. 270, pl. 46, fig. 6, ♂ (1891). Pap. Mariæ *subsp.* Almæ, Rothschild, *l.c.* p. 244 (1895), *Habitat.* Polillo, Philippines.—*Menelaides Phegeus* (Pap. Phegeus, Hopffer, Stett. Ent. Zeit, 1866, p. 32. Rothschild, *l.c.* p. 244. Pap. (Men.) Phegeus Semper, *l.c.* p. 270, pl. 46, fig. 4, ♂ (1891). *Habitat.* Samar; Panaon; Mindanao.—*Menelaides Atropos* (Pap. Atropos, Staudinger, Iris, 1888, p. 276; *ib.* 1889, p. 11. Rothschild, *l.c.* p. 245. *Habitat.* Palawan.—*Menelaides Schadenbergi* (Pap. (Men.) Schadenbergi, Semper, *l.c.* p. 269, pl. 44, fig. 1 ♂, pl. 45, fig. 5, ♀ (1891). Rothschild, *l.c.* p. 245. *Habitat.* N.W. Luzon; Babuyanes.—*Menelaides Micholitzii* (Pap. (Men.) Micholitzii, Semper, *l.c.* p. 269, pl. 44, fig. 2 ♂, pl. 45, fig. 6 ♀ (1891). Pap. Schadenbergi *subsp.* Micholitzii, Rothschild, *l.c.* p. 245. *Habitat.* N. E. Luzon.—*Menelaides Philippus* (Pap. (Men.) Aristolochiæ *var.* Philippus, Semper, *l.c.* p. 169, pl. 44, fig. 7, 8, 9 ♂, pl. 45, fig. 3, 4 ♀, pl. 46, fig. 1 *aber.* ♂ (1891). Pap. Aristolochiæ *subsp.* Philippus, Rothschild, *l.c.* p. 250. *Habitat.* S.E. Islands, Philippines.—*Menelaides Kotzebueus* (Pap. Kotzebuea, Esch. Kotzeb. Reise, iii. p. 202, pl. 1, fig. 2, 2a ♀ (1821). Dewitz, Nov. Acta Acad. N. C. 1882, p. 264, pl. 2, fig. 3, 3a, b. Pap. Arist. *subsp.* Kotzebueus, Rothschild, *l.c.* p. 250 (1895). *Syn.* Pap. Antiphus, Thon, Nat. Schmett. p. 19, pl. 7, fig. 35, 36 (1837). Semper, Phil. Tagf. p. 267, pl. 44, fig. 3, 4 ♂, 5 ♀, pl. 45, fig. 1, 2 ♀ (1891). *Habitat.* N. and W. Philippines. Sulu Islands.—*Menelaides Acutus* (Pap. Acuta, Druce, P. Z. S. 1873, p. 358. P. Antiphus *var.* Acuta, Oberth. Et. Ent. iv. p. 113 (1879). Semper, *l.c.* p. 268 (1891). P. Arist. *subsp.* Acutus, Rothschild, *l.c.* p. 251. Pap. Antiphus *var.* Periphus Oberth. *l.c.* p. 113. P. Antiphus *var.* acuta, *aber.* brevicauda, Staudinger, Iris, 1889, p. 10. *Habitat.* N. Borneo; Palawan.—*Menelaides Antiphus* (Pap. Antiphus, Fabr. Ent.

Syst. iii. 1, p. 10 (1793). *Donov. Ins. Ind.* pl. 15, fig. 2 (1800). De Haan, *Verh. Nat. Gesch. Ned.* p. 49, pl. 8, fig. 2 ♀ (1840). Hagen, *Iris*, p. 20, pl. 1, fig. 1 (1894). Pap. (Men.) Antiphus, de Nicéville, *J. As. Soc. Bengal*, 1895, p. 510. Pap. *Aristolochia*, *subsp.* Antiphus, Rothschild, *l.c.* p. 251. Pap. *Theseus*, Butler, *Catal. Fabr. Lep. B. M.* p. 258, *nec* Cramer. *Habitat.* Sumatra; Nias; Java; Borneo.

#### Genus LOSARIA.

*Papilio* (part), Doubleday and Hewitson, *Gen. D. Lep.* i. p. 5 (1846).

*Papilio* (group 2), Rothschild, *Nov. Zool.* ii. p. 252 (1895).

Male. *Forewing* extremely long and narrow; apex convex, exterior margin of nearly parallel width from the costa throughout its length, posterior margin very short; cell very long and narrow. *Hindwing* short anteriorly, prolonged posteriorly; exterior margin deeply scalloped, and with a lengthened broadly spatulate-tipt tail at end of upper median veinlet; abdominal margin slightly folded over and grooved along the submedian vein, the groove furnished with long fine hairs. *Body* moderately stout; abdomen with prominent large anal valves; posterior tibia slightly incrassated towards the middle, densely clothed with very short fine spiny scales.

TYPE.—L. Coon.

#### LOSARIA DOUBLEDAYI (Plate 438, fig. 1, 1a, ♂, 1b, ♀).

*Papilio Doubledayi*, Wallace, *Trans. Linn. Soc. Lond.* xxv. p. 42 (1865). Moore, *Proc. Zool. Soc.*

*Lond.* 1878, p. 840. Oberthür, *Etudes Ent.* iv. p. 45 (1879). Distant, *Rhop. Malayana*, p. 336, pl. 33, fig. 4, ♀ (1885). Rothschild, *Nov. Zool.* ii. p. 253 (1895).

*Papilio (Menelaides) Doubledayi*, Elwes and de Nicéville, *Journ. As. Soc. Bengal*, 1886, p. 435.

*Menelaides Doubledayi*, Moore, *Journ. Linn. Soc. Lond. Zool.* 1886, p. 51.

IMAGO.—Male. Upperside. *Forewing* very long and narrow; fuliginous-black, outer veins bordered with short pale fuliginous-grey streaks, and similar pale streaks extending within the cell from base to the end. *Hindwing* rich dark bluish-black; with a large central vein-divided white or ochreous-white patch, extending across fully the apical half of the cell, within the basal interspaces of the outer veins and between the median and submedian below the cell, the portions between the medians narrow, the upper or costal portion being either broad or narrow, the cell-area traversed by two longitudinal faint blackish lines; the abdominal margin and its fringe of hairs being fuliginous-brown; beyond are three upper-submarginal whitish lunules, the lower being sometimes, and occasionally all three, crimson-tinted, followed by a lower-submarginal bright crimson short lunule in the middle median interspace, this latter being sometimes absent; a marginal spot at end of the middle

median, and a recurved lunule from the lower anal angle. Underside. *Forewing* paler; the vein streaks also paler. *Hindwing* as on upperside. *Thorax* above and below black; palpi black; frontal tuft, collar, sides of thorax beneath, and abdomen crimson; abdomen above and beneath with black segmental bands and lateral spots; antennæ and legs black.

Female. Upperside duller coloured. *Forewing* shorter and broader; outer vein streaks somewhat narrower. *Hindwing* with the central white patch somewhat smaller, the two short outer-median portions more or less obsolescent; outer lunules paler, the lower anal lunule partly white. Underside similar to the upper. *Body* pale red.

Expanse, ♂ 5 to  $5\frac{1}{2}$ , ♀  $4\frac{1}{2}$  inches.

HABITAT.—Burma; Tenasserim; Malay Peninsula.

DISTRIBUTION.—“Not uncommon near Rangoon and Moulmein in October and November. Taken also in June. Males much more common than the female” (Col. C. H. E. Adamson, List, p. 47). Mr. Ossian Limborg obtained it “on the road from Moulmein to Meetan, Upper Tenasserim” (P. Z. S. 1878, 840). Signor L. Fea took it at Moolayet in March. Col. C. T. Bingham found it at Thoungyen in December, on the Donat Range in January, and at Rangoon from August to December. Mr. H. J. Elwes records it from “Tavoy, Tenasserim” (J. As. Soc. Bengal, 1886, 435). It also occurs at Perak, Malay Peninsula.

#### LOSARIA CACHARENSIS (Plate 439, fig. 1, 1a, ♂, 1b, ♀).

*Papilio Cacharensis*, Butler, Ann. and Mag. Nat. Hist. 1885, p. 344.

*Papilio Doubledayi*, Butler, Trans. Ent. Soc. Lond. 1879, p. 8.

*Papilio (Menelaides) Doubledayi*, Wood-Mason and de Nicéville, Journ. As. Soc. Bengal, 1886, p. 377.

*Papilio Doubledayi*, subsp. Cacharensis, Rothschild, Nov. Zool. ii. p. 253 (1895).

IMAGO.—Smaller than *Doubledayi*. Male. Upperside. *Forewing* shorter, paler; the black cell-lines more slender, and the black vein-streaks narrower. *Hindwing* with the central white patch composed of smaller, shorter and wider-separated portions, the cell portion being restricted to about one-third the apical area; the three upper submarginal lunules smaller, the lower or fourth submarginal lunule, the marginal spot and the recurved lunule at the lower anal angle, either pale ochreous or crimson. Front of head, collar, sides of thorax beneath, and abdomen pale ochreous or pale crimson.

Female. Upperside paler. *Forewing* with the cell and vein streaks as in male. *Hindwing* with the central white patch composed of wider-separated portions, the cell portion being restricted to a short streak; the outer lunules paler, the recurved lower anal lunule partly white. Underside as in the upper.

HABITAT.—Cachar; Assam.

DISTRIBUTION.—Mr. J. Wood-Mason records “five males taken at Silcuri, Irangmara, and Doorband, Cachar, from May to July. It has a musk-scented body” (J. As. Soc. Bengal, 1886, 377). Mr. W. Rothschild has it from Dullabcherra, Cachar.

### LOSARIA SAMBILANGA.

*Papilio Doubledayi*, var. *Sambilanga*, Doherty, Journ. As. Soc. Bengal, 1886, p. 263.

*Papilio Doubledayi*, subsp. *Sambilanga*, Rothschild, Nov. Zool. ii. p. 254 (1895).

IMAGO.—“Intermediate between *Doubledayi* and *Rhodifer*. The tail is black in *Doubledayi*. Of the discal semicircle of whitish spots on the hindwing, that on the abdominal margin is very short, those between the middle median and the radial are generally absent above and quite rudimentary below. The anal orange spot is large, the marginal one at the end of the middle median is joined with the submarginal one between the two upper medians, both above and below, very much as in *Rhodifer*. The female is similar, but the wings are wider and the tails much shorter and broader.”

HABITAT.—Great Nicobar Island.

DISTRIBUTION.—Mr. Doherty states that it is “rather common on Great Nicobar Island” (*l.c.*). We have not seen specimens of this species.

### LOSARIA RHODIFER (Plate 440, fig. 1, ♂, 1a, ♀).

*Papilio Rhodifer*, Butler, Entom. Monthly Mag. xiii. p. 57 (1876). Moore, Proc. Zool. Soc. Lond. 1877, p. 592. Oberthür, Etudes Ent. iv. p. 45 (1879). Wood-Mason, Journ. As. Soc. Bengal, 1880, p. 240; de Nicéville, *ib.* 1881, p. 253. Staudinger, Exot. Schmett. i. p. 6, fig. 3, ♂ (1884). Haase, Untersuch. iib. Mim. p. 26, pl. 6, fig. 40 (1893). Rothschild, Nov. Zool. ii. p. 254 (1895).

IMAGO.—Male. Upperside. *Forewing* long and narrow; fuliginous-black, with pale fuliginous-grey short broad streaks bordering the outer veins and longitudinal streaks within the cell. *Hindwing* black; abdominal margin brown; with a central white vein-divided patch extending across half the cell to near its apex, and within the basal interspaces of the outer veins to the submedian interspace below the cell, the portion in the lower median interspace being small and narrow, that in the middle median minute or absent, very rarely one is also present in the upper median interspace; beyond are three submarginal whitish lunules, the upper one being much the smallest or obsolescent, and then two lower marginal larger lobed-lunules extending upward from the inner angles, the two latter being pale crimson and slightly speckled anteriorly with white and black scales, and posteriorly with pale

crimson scales; tip of tail with a large paler crimson spot. Underside. *Forewing* paler; vein streaks also paler. *Hindwing* similar to the upperside. *Thorax* black; abdomen pale crimson, with black basal bands and lateral spots; front of head, palpi, collar, and sides of thorax beneath pale crimson; antennæ and legs black.

Female. Upperside. *Forewing* broader than in male; pale streaks similar. *Hindwing* with the central white patch as in the male; the three upper submarginal lunules somewhat larger, the lower partly speckled with crimson scales, these scales also extending to the outer angle, the two lower marginal lobed-lunules and the tip of tail bright crimson. Underside similar to the upperside, except that there is a very small white-speckled spot also present in the costal interspace.

Expanse, ♂ 5 to  $5\frac{1}{4}$ , ♀  $4\frac{3}{4}$  to 5 inches.

HABITAT.—Andaman Isles.

DISTRIBUTION.—Mr. F. A. Roepstorff obtained it at Port Blair, S. Andamans.

INDO-MALAYAN SPECIES.—*Losaria Coon* (Papilio Coon, Fabricius, Ent. Syst. iii. 1, p. 10 (1793). Donovan, Ins. China, pl. 24, fig. 1 (1798). Zinken-Sommer, Nova Acta Ac. N. C. (1832), p. 146, pl. 14, fig. 3. Lucas, Lep. Exot. p. 11, pl. 6, fig. 2 (1835). Boisd. Spec. Gén. Lep. i. p. 201 (1836). Blanchard, Hist. Nat. Ins. iii. p. 421, pl. 2, fig. 1 (1840). Chenu's Encyc. II. N. Pap. pl. 14, fig. 1 (1851). Rothschild, Nov. Zool. ii. p. 252 (1895). *Syn.* Pap. Hypenor, Godart, Enc. Meth. ix. p. 65 (1819). Achillides Hypenor, Hübner, Samm. Exot. Schmett. iii. pl. 23, figs. 1, 2 (1834-41). *Habitat.* Java.—*Losaria Patianua* (Pap. Coon *aber.* Patianus, Fruhstorfer, Berl. Ent. Zeit. 1898, p. 309. *Habitat.* N. Java.—*Losaria Palembangana* (Pap. Palembanganus, Rothschild, Nov. Zool. iii. p. 421 (1896). *Habitat.* Sumatra.—*Losaria Deliana* (Pap. Doubledayi, *var.* Delianus, Fruhstorfer, Ent. Nach. 1895, p. 196. Rothschild, *l.c.* p. 254. de Nicéville, Journ. As. Soc. Bengal, 1895, p. 511. *Habitat.* Sumatra.

Genus BALIGNINA. *Forewing* elongated, triangular; costa arched, apex convex, exterior margin very oblique, posterior margin short. *Hindwing* short, not prolonged posteriorly, exterior margin scalloped, with a long basally attenuated spatular-tipt tail; abdominal fold when opened displaying an elongated patch of white scales extending from the base to anal angle, and long erectile white hairs along edge of the submedian vein. Abdomen with prominent anal valves; hind tibia incrassated towards the middle. *Type.* B. Neptuna.—*Balignina Neptuna* (Papilio Neptunus, Guérin, Rev. Zool. 1840, p. 43; *id.* Delessert's Voy. Ind. ii. p. 69 (1843). Wallace, Tr. Linn. Soc. 1865, p. 42. Distant, Rhop. Malay. p. 335, pl. 33, fig. 5 ♂, 6 ♀ (1885). Rothschild, Nov. Zool. ii. p. 255 (1895). *Syn.* P. Saturnus, Guérin, Deless. *l.c.* pl. 19 (1843). Pap. Thetys, Guénee, Lep. Mus. Genève, p. 10, pl. 1, fig. 5 (1878). *Habitat.* Malay Peninsula; Borneo.—*Balignina Sumatrana* (Pap. Neptunus, *var.* Sumatranus, Hagen, Iris, 1894, p. 21. Rothschild, *l.c.* p. 225. Pap.

(Men.) Sumatranus, de Nicéville, J. As. Soc. Bengal, 1895, p. 511. *Habitat.* Sumatra.—*Baliguina Fehri* (Pap. Neptunus, var. Fehri, Honrath, Berl. Ent. Zeit. 1891, p. 432. Rothschild, *l.c.* p. 255. *Habitat.* Nias.

#### Genus SAINIA.

*Sainia*, Moore, Proc. Zool. Soc. Lond. 1882, p. 260.

*Papilio* (part), Doubleday and Hewitson.

*Papilio* (sect. 65, subsect. D, part), Felder, Verh. Z. B. Ges. Wien. 1864, pp. 324, 372.

*Papilio* (group xi.), Rothschild, Nov. Zool. ii. p. 331 (1895).

IMAGO.—Male. *Forewing* elongated, triangular; costa much arched, apex rounded, exterior margin very oblique and slightly concave in the middle, uneven, posterior margin short. *Hindwing* moderately short anteriorly, somewhat prolonged posteriorly, exterior margin slightly convex and scalloped anteriorly, somewhat truncate and less scalloped posteriorly, anal angle lobed; basal area hairy; abdominal margin with a narrow grooved-fold along submedian vein; cell long, broad at the end; costal vein and subcostal veinlets long. Female similar in shape to the male. Both sexes tailless. *Body* short and slender; antennæ slender; anal valves narrow, obtusely pointed at the tip.

LARVA.—Head small; anterior segments increasing in size to the fourth and thence of same thickness to near end; on second and last segment is a pair of short blunt tubercles; fourth segment surmounted by a rough transverse ridge.

PUPA.—Unknown.

TYPE.—S. *Protenor*.

#### SAINIA PROTENOR (Plate 444, fig. 1, larva, 1a, b, ♂, 1c, d, ♀).

*Papilio Protenor*, Cramer, Pap. Exot. i. p. 77, pl. 49, fig. A, B, ♂ (1775). Goeze, Ent. Beytr. iii. 1, p. 43 (1779). Fabricius, Spec. Ins. ii. p. 7 (1781); Mant. Ins. ii. p. 4 (1787); Ent. Syst. iii. 1, p. 13 (1793). Jablonsky and Herbst, Nat. Schmett. ii. p. 5, pl. 7, fig. 1, 2 (1784). Esper, Ausl. Schmett. p. 133, pl. 33, fig. 2 (1792). Godart, Encyc. Méth. ix. p. 30 (1819). Boisduval, Spec. Gén. Lep. i. p. 198 (1836). De Haan, Verh. Nat. Gesch. Ned. p. 25 (1840). Doubleday and Hewitson, Gen. D. Lep. i. p. 10 (1846). Hutton, Trans. Ent. Soc. Lond. 1847, p. 49. Gray, Catal. Lep. B. M. i. p. 14 (1852). Moore, Catal. Lep. Mus. E. I. Company, i. p. 98 (1857); *id.* Proc. Zool. Soc. Lond. 1865, pp. 487, 756. Lang, Ent. Mo. Mag. 1864, p. 101. Felder, Verh. Z. B. Ges. Wien. 1864, p. 324. Oberthür, Etud. Ent. iv. p. 37 (1879); *id.* xvii. p. 2 (1893). Staudinger, Exot. Schmett. i. p. 9, pl. 5, ♂ (1884). Elwes, Trans. Ent. Soc. Lond. 1888, p. 428. Leech, Butt. of China, ii. p. 545 (1893). Rothschild, Nov. Zool. ii. p. 331 (1895).

*Ilades Protenor*, Hübner, Verz. bek. Schmett. p. 89 (1816).

*Sainia Protenor*, Moore, Proc. Zool. Soc. Lond. 1882, p. 260. Swinhoe, Trans. Ent. Soc. Lond. 1893, p. 312.

*Papilio (Sainia) Protenor*, Doherty, Journ. As. Soc. Bengal, 1886, p. 137. Mackinnon and de Nicéville, Journ. Bombay, N. H. Soc. 1898, p. 592, pl. W, fig. 23, larva.

*Papilio Lamedon*, Fabricius, Ent. Syst. iii. 1, p. 12 (1793). Donovan, Ins. of China, pl. 25, ♀ (1798).



IMAGO.—Male. *Forewing* fuliginous or greyish-black, with a black or blue-black longitudinal streak between the veins and similar streaks within the cell; cilia alternately edged with white. *Hindwing* blue-black, with a broad longitudinal greyish-white scaled streak below the costal vein; outer discal area more or less irrorated with scattered minute blue scales; an ocellated crimson spot with black centre at the anal angle, the crimson being outwardly edged with bluish-grey scales; cilia alternately edged with white. Underside. *Forewing* greyish-fuliginous, the black streaks prominent. *Hindwing* black; with a large, duller crimson violet-scaled ocellated anal patch which extends irregularly inward to or near the middle median, and is posteriorly coalescent with a large lower anal ocellus with black centre; beyond, are either two upper marginal dull crimson incomplete ocelli speckled with bluish-white scales, or a series of five lunules, the three lower being placed more submarginally inward and decreasing in size posteriorly; a few minute blue scales are scattered inwardly contiguous to the latter lunules.

Female. Upperside. Both wings paler. *Hindwing* with the upper discal area or the entire wing to the base irrorated with minute bluish-grey scales; a large anal dull crimson violet-speckled irregular-shaped ocellated patch, and lower anal ocellus, very similar to that on the underside of the male; a small crimson submarginal lunule is also sometimes present between the lower and middle median veinlet. Underside paler. *Hindwing* with similar markings to the male; the anal irregular patch and lower anal ocellus being larger and coalescent, the former sometimes extending outward to near the upper median, and is also occasionally followed by a slender lunule beyond the upper median veinlet. *Head*, palpi, thorax, and abdomen, legs and antennæ black; collar and vertex with a few white-tipt scales.

Expanse, ♂  $3\frac{1}{2}$  to 5, ♀  $4\frac{1}{2}$  to 5 inches.

LARVA.—Head small, anterior segments increasing in size to the fourth and thence of nearly same thickness to near the end; second and last segment each with a pair of short blunt tubercles; colour green, with a yellow collar, and brown lichenoid markings.

PUPA.—Unknown.

HABITAT.—W. and E. Himalayas; Assam; Khasia Hills; Burma; C. and W. China; Tonkin; Hong Kong.

DISTRIBUTION AND HABITS.—“This is by no means an uncommon species in the warm glens of the Masuri Hills, N.W. Himalaya, and it is common in the Dhun. Its flight is somewhat heavy and unsteady” (Capt. T. Hutton, Tr. Ent. Soc. 1847, 49). “A considerable number seen together, in the Masuri Hills, floating and flapping their wings lazily, and then settling on the blossoms in waste marshy ground overgrown with *Compositæ* (thistles). I have also seen a number congregated with *Pap.*

*Polyctor* on the damp sandy margins of streams in the Hills—on these occasions, if disturbed, they disperse, only to collect in groups again. Elevation 4000 to 7000 feet” (Capt. A. M. Lang, Ent. Mo. Mag. 1864, 101). Mr. P. W. Mackinnon records it as “very common, in the low valleys about Masuri, in company with *Pap. Polyctor*, from March to October. Specimens of the *spring brood*, which fly in March and April, are very small as compared with those of the *rainy season*. The larva feeds on *Zanthoxylum alatum* (Order Rutaceæ); it is green, with a yellow collar, and brown lichen-like markings. Some pupæ are coloured like rough bark, others are uniformly green” (Journ. Bombay N. H. Soc. 1898, 592). Mr. W. Doherty found it in “Kumaon generally, from 2000 to 6000 feet elevation, though not very common” (Journ. As. Soc. Bengal, 1886, 137). Mr. H. J. Elwes says, “Mr. O. Möller records this species as occurring in Sikkim from 2000 to 3000 feet, from April until October, but it occurs at much higher elevations in the N.W. Himalaya, and in the Khasias I have seen it up to at least 6000 feet. It is not, however, so common in Sikkim as in some other parts of the Himalaya, and the female is decidedly rare. I have never taken it myself in Sikkim” (Tr. Ent. Soc. 1888, 428). Mr. L. de Nicéville records it as “somewhat rare in Sikkim, and occurs from 2000 to 5000 feet elevation throughout the warm months” (Sikkim Gazetteer, 1894, 172). Col. C. Swinhoe records it from the Khasia Hills (Tr. Ent. Soc. 1893, 312). Col. C. H. E. Adanson took “two specimens at Tsinbo, north of Bhamo, Burma, in May” (List, 1897, 46). We possess specimens from Simla, N.W. Himalaya, Nepal, Sikkim, and Looshai. The British Museum has examples from Kumaon; taken in May by Col. J. C. Pilcher; Nepal; Bhotan, taken in August by Mr. G. C. Dudgeon; Sibsagar, Assam, and the Khasia Hills. It is also recorded from Central and Western China, Tonkin, and Hong Kong.

Of our illustrations on Plate 444, fig. 1 represents the larva—copied from Mr. Mackinnon’s drawing; fig. 1a and 1d, from a Nepal male and female; fig. 1b and 1c, male and female from Sikkim.

CHINA AND JAPAN SPECIES.—*Sainia Formosana* (Pap. *Protenor* *subsp.* *Formosana*, Rothschild, Nov. Zool. v. p. 602 (1898). *Habitat.* Formosa.—*Sainia Demetrius* (Pap. *Demetrius*, Cramer, Pap. Exot. iv. p. 196, pl. 385, fig. E, F (1782). Jablonsky and Herbst, Nat. Schmett. ii. pp. 223, 289, pl. 20, fig. 1 (1784). Esper, Ausl. Schmett. p. 128, pl. 32, fig. 2 (1792). Boisduval, Spec. Gén. Lep. i. p. 199 (1836). De Haan, Verh. Nat. Gesch. Ned. p. 25, pl. 6, fig. 1 ♂, 2 ♀ (1840). Pryer, Rhop. Nippon, p. 4, pl. 3, fig. 1 (1886). Leech, Butt. China and Japan, ii. p. 546 (1893). Rothschild, Nov. Zool. ii. p. 332 (1895). *Syn.* Pap. *Carpenteri*, Butler, Ann. Nat. Hist. 1882, p. 318. *Habitat.* Japan; C. and E. China, Loo-Choo Islands.—*Sainia Macilenta* (Pap. *Macilentus*, Janson, Cist. Ent. ii. p. 158, pl. 5, fig. 1 (1877). Pryer, Rhop. Nippon. p. 4, pl. 3, fig. 2, ♀ (1886). Leech, *l.c.* p. 547 (1893). *Syn.* Pap.

Scævola, Oberthür, *Etud. Ent.* iv. p. 37, pl. 6, fig. 1 (1879). *Pap.* *tractipennis*, Butler, *Ann. Nat. Hist.* 1881, p. 139. *Habitat.* Japan.

### Genus PANOSMIOPSIS.

*Papilio*, subgen. *Panosmiopsis*, Wood-Mason and de Nicéville, *Journ. As. Soc. Bengal*, 1886, p. 374.

*Papilio* (part), Doubleday and Hewitson.

*Papilio* (sect. 65, subsect. D, part), Felder, *Verh. Z. B. Ges. Wien.* 1864, pp. 324, 372.

*Papilio* (group xii.), Rothschild, *Nov. Zool.* ii. p. 333 (1895).

IMAGO.—Male. *Forewing* elongated, triangular, narrower than in *Sainia*, posterior margin shorter. *Hindwing* shorter anteriorly, more prolonged posteriorly, exterior margin less convex; cell more pointed at the apex; tailless. A “sexual mark,” composed of a large impressed-patch of scales, is present on the underside of the hindwing, placed between the radial and lower subcostal veinlet.

Female. *Forewing* similar to the male. *Hindwing* more prolonged, more deeply scalloped, and with a broad short tail.

LARVA AND PUPA.—UNKNOWN.

TYPE.—P. Rhetenor.

### PANOSMIOPSIS RHETENOR (Plate 445, fig. 1, 1a, ♂, 1b, ♀).

*Papilio Rhetenor*, Westwood, *Arcana Entom.* i. p. 59, pl. 16, fig. 1, 1a, ♂ (1842). Doubleday and Hewitson, *Gen. D. Lep.* i. p. 10 (1846). Kollar, in Hügél's *Reise Kaschmir*, iv. 2, p. 403 (1844). Gray, *Catal. Lep. B. M.* i. p. 15 (1852). Moore, *Catal. Lep. Mus. E. I. Company*, i. p. 98 (1857); *id.* *Proc. Zool. Soc. Lond.* 1865, p. 756. Felder, *Verh. Z. B. Ges. Wien.* 1864, p. 324. Oberthür, *Etud. Ent.* iv. p. 37 (1879). Wood-Mason, *Ann. Nat. Hist.* 1882, p. 104, ♂ ♀. Staudinger, *Exot. Schmett.* i. p. 9 (1884). Elwes, *Trans. Ent. Soc. Lond.* 1888, p. 428. ♂ ♀. Manders, *id.* 1890, p. 535. Leech, *Butt. of China*, ii. p. 549 (1893). Haase, *Untersuch. iib. Mim.* p. 53, pl. 5, fig. 33, ♀, 34, ♂ (1893). Rothschild, *Nov. Zool.* ii. p. 333 (1895).

*Papilio (Panosmiopsis) Rhetenor*, Wood-Mason and de Nicéville, *Journ. As. Soc. Bengal*, 1886, p. 374. de Nicéville, *Sikkim Gaz.* 1894, p. 171, ♂ ♀.

*Sainia Rhetenor*, Swinhoe, *Trans. Ent. Soc. Lond.* 1893, p. 312.

*Papilio Iearius*, Westwood, *Cabinet of Orient. Entom.* p. 5, pl. 2, ♀ (1848).

*Papilio Almenor*, Felder, *Verh. Z. B. Ges. Wien.* 1864, p. 324; *id.* *Reise Novara, Lep.* i. p. 129, pl. 20, fig. d, ♂ (1865). Haase, *Untersuch. iib. Mim.* p. 54, fig. 6, ♀ (1893).

IMAGO.—Male. Upperside. *Forewing* rich bluish-grey black, darkest basally; with a blue-black longitudinal streak between the veins and similar streaks within the cell; the intervening pale longitudinal streaks between the lower median and posterior angle are, in most specimens, either sparsely speckled with greyish-white scales, or densely speckled and prominent; a more or less apparent crimson-scaled streak at base of the cell, this streak ascending narrowly along base of the subcostal,

or broadly across the cell to below base of the median vein, in some a few only of these crimson scales are visible; cilia alternately edged with white. *Hindwing* rich blue-black, or olivescence-black; the upper discal area more or less sparsely irrorated with minute blue scales; with a more or less complete irregular-shaped white ocellus centred with a round black spot at the anal angle, this ocellus is variable in size, or rarely almost obsolescent, it is generally speckled anteriorly with crimson scales and occasionally posteriorly with black scales, and in some specimens this ocellus is followed in the lower median interspaces by a single submarginal lunule or an opposed pair (upper and lower) of white lunules, these latter sometimes being joined and then form a ring; cilia alternately edged with white. Underside. *Forewing* paler; with a crimson patch at base of the cell and costa. *Hindwing* black; with a "sexual mark" composed of a discal *impressed-patch* of duller scales situated between the radial and lower subcostal veinlet; between the costal vein and the lower subcostal are two outer clusters of blue scales; the base and a band along abdominal border from the submedian to the middle median crimson, intersected by black veins, the latter portion speckled with white scales, the median interspace bearing three black spots, the lowest sometimes posteriorly with a white tip, two much smaller black spots, or occasionally one only, above the anal angle; beyond, in the upper median interspace is generally a small submarginal crimson lunate-spot, or a well-formed lunule or two opposed lunate spots, and, more rarely, also two similar small spots in the lower subcostal interspace.

Female. Upperside paler. *Forewing* with a crimson streak along upper base of the cell. *Hindwing* with a broad short spatular tail; a broad white vein-intersected discal patch extending from within the cell to above the lower subcostal and to the middle median, this patch being anteriorly more or less edged with black scales; below is a large irregular-shaped crimson anal ocellus speckled posteriorly with white scales and centred with a black spot, followed by three inner-submarginal crimson lunules varying in size, and sometimes also an upper small spot, and then by a marginal corresponding series of broad crimson lunules, the two lowest of which are much the largest and irregular in shape. Underside paler. *Forewing* with the base of the cell and costa crimson. *Hindwing* with the crimson base and abdominal border similar to the male, the latter being more broken and irregular, and the lower black spot larger; the black spot in the next or upper median interspace generally larger, and either entirely or partially encompassed by the crimson border, the two upper pair of crimson lunules being small. *Head*, thorax and abdomen above black; front of thorax and vertex white spotted; body beneath fuliginous-black; antennæ and legs black.

Expanse, ♂  $4\frac{1}{2}$  to  $5\frac{1}{4}$ , ♀  $4\frac{1}{2}$  to  $5\frac{1}{2}$  inches.

LARVA AND PUPA.—Unknown.

HABITAT.—Nepal; Sikkim; Bhotan; Assam; Cachar; Khasia Hills; Burma; Shan States; C. and W. China.

DISTRIBUTION.—A female from Nepal, from Gen. G. Ramsay's collection is in our possession, and another in the British Museum. Mr. H. J. Elwes records it from Sikkim, "males being found not uncommonly in the lower valleys, and up to 5000 or 6000 feet, from April to October. The female is rare" (Tr. Ent. Soc. 1888, 429). Mr. L. de Nicéville says, "both sexes are rare in Sikkim, the female especially so. It occurs from April to October, and from the level of the Terai up to 6000 feet" (Sikkim Gaz. 1894, 171). Mr. G. C. Dudgeon took males in Bhotan, in July. Capt. E. Y. Watson obtained it in Assam. Mr. J. Wood-Mason records "two females, captured on Nemotha Peak, Cachar, in September, which were flying in company with *Pap. Dasarada*" (Journ. As. Soc. Bengal, 1886, 374). Col. C. Swinhoe received "a number of both sexes from the Khasia Hills" (Tr. Ent. Soc. 1893, 312). A male, labelled "Barrackpur," near Calcutta, taken by the late Gen. Hearsey, is in the British Museum. Col. C. H. E. Adamson obtained both sexes in the Arakan Hills, in April, and males in the Taoo plateau, Upper Tenasserim, in March. Both sexes have also been taken at Moolai, Upper Tenasserim. Mr. L. de Nicéville records "males only, taken by Mr. T. A. Hauxwell in the Daunat Range, Upper Tenasserim, in February" (Journ. Bombay N. H. S. 1899, 335). Capt. Longe, R.E., obtained "a single male at 2000 feet, on the Manipur River, in February, and Dr. Graves captured a male at 5000 feet during the rains" (Journ. Bombay N. H. S. 1897, 671). Dr. N. Manders records it as "apparently an uncommon species in the Shan States, as I have only taken it at Fort Stedman in October" (Tr. Ent. Soc. 1890, 535).

CHINESE SPECIES.—*Panosmiopsis Elwesi* (Papilio Elwesi, Leech, Trans. Ent. Soc. Lond. 1889, p. 113, pl. 7, fig. 1, ♂; *ib.* Butt. of China, ii. p. 550 (1893). Watson, Entom. News, p. 279, pl. 12, ♀ (1893). Rothschild, Nov. Zool. ii. p. 335 (1895). *Habitat.* C. China.

#### Genus ILIADES.

*Iliades*, Hübner, Verz. bek. Schmett. p. 88 (1816). Moore, Lep. of Ceylon, i. p. 147 (1881).

*Papilio* (part), Doubleday and Hewitson, Gen. D. Lep. i. p. 5 (1846).

*Papilio* (sect. 65, subsect. A, B, C), Felder, Verh. Z. B. Ges. Wien. pp. 323, 371, 372 (1864).

*Papilio* (group x.), Rothschild, Nov. Zool. ii. p. 312 (1895).

IMAGO.—Wings large. *Forewing* elongatedly-triangular; costa much arched, exterior margin very oblique, posterior margin short; cell long and broad; first subcostal branch emitted at one-third and second at one-fifth before end of the cell, third branch from its end, fifth at one-third from below the fourth; discocellulars of equal length, upper slightly oblique, radial from their angle; median branches at

nearly equal distances apart; a transverse short veinlet connecting the median and submedian vein near the base, and a short basal veinlet curving from below the submedian. *Hindwing* broad; exterior margin convex and scalloped; cell extending to half the wing; first subcostal branch at one-half before end of the cell; upper discocellular oblique, lower bent inward, radial from their angle; lower median veinlet at one-half before end of the cell; submedian vein much curved in the middle. *Body* stout; abdomen moderately short; hind tibia slender, with rows of short fine spines; antennæ with a slender club. Sexes dissimilar; inodorous.

Female. Dimorphic in the shape of the hindwing, which is either tailless, or with a spatulate tail at end of the upper median veinlet.

LARVA.—Elongated; anterior segments scutellated; the 3rd, 4th and 5th segment thickened; head attenuated; an ocellated spot on each side of the 4th segment, and a slight fleshy tubercle on the anal segment.

PUPA.—Thick; curved backwards and prolonged at the apex; head obtusely bifid; thorax broad, somewhat dorsally convex and pointed in front; abdominal segments very slightly tuberculate dorsally; wing-cases laterally dilated and angular in the middle.

TYPE.—I. Memnon.

#### ILIADES AGENOR (Plates 446, 447, 448, 449).

- Papilio Agenor*, Linnæus, Syst. Nat. ed. x. p. 460, ♀ (1758); *id.* Mus. Lud. Ulr. p. 194, ♀ (1764); *id.* Syst. Nat. ed. xii. p. 747, ♀ (1767). Clerck, Icones Ins. i. pl. 15, upper fig. ♀ (1759). Houttuyn, Nat. Hist. i. 2, pl. 87, fig. 2, ♂ (1767). Müller, Naturs. v. 1, p. 570, pl. 17, fig. 2, ♂ (1774). Fabricius, Syst. Ent. p. 446, ♀ (1775). Cramer, Pap. Exot. i. p. 52, pl. 32, fig. A, B, ♀ (1775). Jablonsky, Nat. Schmett. ii. p. 20, pl. 8, fig. 3, ♀ (1784). Esper, Ausl. Schmett. pl. 8, fig. 1, ♂ (1785), *ib.* pl. 26, fig. 1, ♀ (1792). Donovan, Ins. China, pl. 24, fig. 2, ♀ (1798). Distant, Rhop. Malay. p. 339, pl. 29, fig. 1, ♀ (1885).
- Iliades Agenor*, Hübner, Verz. bek. Schmett. p. 89, ♀ (1816). Swinhoe, Tr. Ent. Soc. Lond. 1893, p. 312, ♂ ♀.
- Papilio Agenor*, Auivillius, Kongl. Sv. Vet. Acad. Handl. xix. 5, p. 18, ♂ ♀ (1882). Staudinger, Exot. Schmett. i. p. 8, ♂ ♀ (1884).
- Papilio (Iliades) Agenor*, de Nicéville, Sikkim Gazetteer, 1894, p. 172, ♂ ♀.
- Papilio Memnon Agenor*, Rothschild, Nov. Zool. ii. p. 316, ♂ ♀ (1895).
- Papilio Androgeos*, Cramer, Pap. Exot. i. p. 142, pl. 91, fig. A, B, ♂ (1776). Moore, Proc. Zool. Soc. 1865, p. 757, ♂ ♀; *id.* 1878, p. 84, ♂ ♀. Wallace, Trans. Linn. Soc. Lond. 1865, p. 47, ♂ ♀. de Nicéville, Journ. As. Soc. Bengal, 1881, p. 53. Elwes, Trans. Ent. Soc. Lond. 1888, p. 428.
- Papilio (Iliades) Androgeos*, Wood-Mason and de Nicéville, Journ. As. Soc. Bengal, 1886, p. 373.
- Papilio Protenor*, Esper, Ausl. Schmett. p. 120, pl. 29, fig. 2, ♂ (1792).
- Papilio Alcanor*, Cramer, Pap. Exot. ii. p. 107, pl. 166, fig. A, ♀ (1779). Esper, Aus. Sch. p. 134, pl. 34, fig. 2, ♀ (1795).
- Achillides Alcanor*, Hübner, Verz. bek. Schmett. p. 85 (1816).

- Papilio Achates*, Cramer, *l.c.*, ii. p. 130, pl. 182, fig. A, B, ♀ (1779). Esper, *l.c.* p. 116, pl. 28, fig. 1, ♀ (1792). Distant, *Rhop. Malay.* p. 342, pl. 28, fig. 3, 4, 5, ♂ ♀ (1885),  *nec Sulzer.*
- Iliades Achates*, Moore, *Journ. Linn. Soc. Lond. Zool.* 1886, p. 50, ♂ ♀.
- Papilio Alphenor*, Fabricius, *Spec. Ins.* ii. p. 4, ♀ (1781). Jablonsky, *Nat. Schmett.* ii. p. 205, pl. 10, fig. 1, ♀ (1784),  *nec Cramer.*
- Iliades Mestor*, Hübner, *Verz. bek. Schmett.* p. 89, ♂ (1816).
- Papilio Mestor*, Butler, *Trans. Linn. Soc. Lond. Zool.* 1877, p. 553, ♂ ♀. Distant, *Rhop. Malay.* p. 341, pl. 28, fig. 2, ♂, fig. 7, ♀ (1885).
- Papilio Esperii*, Butler, *l.c.* p. 553, pl. 68, fig. 7, ♀ (1877). Distant, *Rhop. Malay.* p. 341, pl. 28, fig. 1, ♂, fig. 6, ♀ (1885). Holland, *Tr. Amer. Ent. Soc.* 1887, p. 122.
- Papilio Phoenix*, Distant, *l.c.* p. 340, pl. 27, B, fig. 7, ♀ (1885).
- Papilio Cilix*, Distant, *l.c.* p. 340, pl. 29, fig. 4, ♂, 5, ♀ (1885).
- Papilio Androgeos* var. *Depelchini*, Robbe, *Ann. Soc. Ent. Belg.* p. 125 (1892), ♂.
- Papilio Memnon Agenor* aber. *Depelchini*, Rothschild, *l.c.* p. 319, ♂ ♀.
- Papilio Memnon Agenor* aber. *primigenius*, Rothschild, *l.c.* p. 319, ♂ (1895).
- Papilio Memnon Agenor* aber. *Butlerianus*, et *Distantianus*, Rothschild, *Nov. Zool.* ii. p. 320, ♀ (1895).

**Form 1** (Plate 446, fig. 1, ♂, 1a, b, ♀).

*Papilio Androgeos* var. *Depelchini*, Robbe, *Ann. Soc. Ent. Belg.* 1892, p. 125, ♂.

*Pap. Mem. Agenor* aber. *Depelchini*, Rothschild, *Nov. Zool.* ii. p. 319, ♂ ♀ (1895).

Male. Upperside. *Forewing* bluish-black, with slightly-defined dark greyish-blue cell and vein-streaks, the latter from the upper median very sparsely outwardly-speckled with greyish-white scales; a red basal cell streak in type specimen. *Hindwing* with the exterior margin acutely scalloped, the angle at end of upper median produced into a short-pointed tooth; colour blue-black, with a dark olivescent gloss; costal border purpurescent tinged; a very few bluish-grey scales present, and these are widely and most irregularly scattered.

Underside. *Forewing* bluish-black; cell and vein-streaks prominent and bluish-grey; base of cell scarlet. *Hindwing* deep black; edges of the veins and bordering of slightly-defined outer-marginal spots beyond the middle median veinlet greyish-black; basal intersected-patch scarlet; anal black spot and the two spots in adjoining median interspace scarlet-bordered, the next marginal spot has also a scarlet upper border.

Female. Upperside. *Forewing* black, basal area darkest; base of cell and a small streak below it scarlet; cell and vein-streaks uniformly olivescent-fuliginous. *Hindwing* with pointed tooth at end of the upper median, but not always developed; dark olivescent greyish-black, the base and disc with a bronzy metallic gloss; the discal area very sparsely sprinkled with a few blue scales; lower marginal blackish spots of the underside slightly apparent; anal black spot partly red-bordered.

Underside. *Forewing* much paler; cell and vein-streaks greyish-white; base of cell scarlet. *Hindwing* black, basal dark area speckled with olive-grey scales, the vein edges and outer-bordering of marginal and submarginal spots greyish black, the

inner-bordering of the latter being ochreous-white with a few blue scales crossing the sub-marginal spots; the anal and two next spots in lower median interspace scarlet-bordered, the submedian interspace above the former being thickly white scaled; basal intersected patch scarlet.

Expanse, ♂ 5, ♀ 5 to 5½ inches.

The above description and our figures 1 ♂, and 1a ♀, on Plate 446, are from Sikkim specimens, taken in August by Mr. Otto Möller, now in Mr. W. Rothschild's collection at Tring; figure 1b is from a Sikkim female in our own possession. The type specimen described by Robbe was taken at Kurseong, Sikkim.

Form 2 (Plate 447, fig. 1, 1a, ♂, 1b, c, ♀).

*Papilio Androgeos*, Cramer, Pap. Exot. i. p. 142, pl. 91, fig. A, B (1776), ♂.

*Iliules Mestor*, Hübner, Verz. bek. Schmett. p. 89 (1816) ♂.

*Papilio Mestor*, Butler, Trans. Linn. Soc. Zool. 1877, p. 553, ♂ ♀. Distant, Rhop. Malay. p. 341, pl. 28, fig. 2, ♂, fig. 7, ♀ (1885).

*Pap. Mem. Agenor* aber. *Butlerianus*, Nov. Zool. ii. p. 320 (1895) ♀.

*Papilio Esperii*, Butler, l.c. p. 553, pl. 68, fig. 7, ♀. Distant, l.c. p. 341, fig. 1, ♂, fig. 6, ♀.

Male (fig. 1, 1a). Upperside blue-black, or olivescient bluish-black; cilia alternated with white. *Forewing* with greyish-blue scaled longitudinal streaks entirely bordering the outer veins to the margin, and less-defined similar streaks within the cell; base of the cell either without, or with a slender scarlet scaled streak, or frequently with a prominent narrow, or more rarely a broad scarlet patch is present. *Hindwing* with greyish-blue scaled broad streaks between the outer veins, extending to near the margin; a few similar coloured scales are also scattered within apex of the cell; occasionally a marginal row of blacker oval spots than the ground colour are somewhat apparent, of which the anal spot rarely show a few outer-bordering red scales. Underside. *Forewing* with broader and paler bluish-grey streaks, and a broad scarlet basal cell-patch. *Hindwing* darker blue-black or purpurescent-black, the outer border and edges of the outer veins generally paler or sometimes greyish-black; base of wing with a vein intersected scarlet patch; a marginal series of more or less apparent or well-defined black oval spots, and a submarginal similar series of conical spots, of which latter the anal spot is small and generally oval; the anal spot in both series is bordered or ringed with ochreous-red or scarlet, and the next one, and sometimes the second, of both rows are also red-bordered, and occasionally the fourth of the inner row; in specimens where the two series of black spots are less apparent beyond the red-bordered anal pair, their division is generally indicated by a bordering series of blue scales; the red borders of the anal spots are also sometimes sprinkled with blue scales. *Body*, legs, and antennæ black; front of thorax and head white-spotted.



Female (fig. 1b, c). Upperside black, the basal area darkest; basal cell-patch and a small streak below it scarlet; cell-streaks and anterior vein-borders fuliginous-grey or blackish-grey, the lower vein borders more or less, or entirely, white; more rarely the anterior vein borders are whitish and then form a subapical patch. *Hindwing* tailless. Purpurescent-black or bluish-black; with greyish-blue scaled-streaks between the outer veins, as in the male; a scarlet-bordered black spot at the anal angle, with the submedian interspace above it sometimes white. Under-side. *Forewing* paler than the upperside; base of cell scarlet. *Hindwing* purpurescent or bluish-black; basal intersected patch scarlet; the borders of the more or less slightly-defined black marginal and submarginal spots paler, and the black anal and the two spots in the next interspace scarlet-bordered, the submedian-interspace above the former being white, and sometimes also the adjoining median-interspace is white and slightly black-scaled, the upper borders of the inner series of black spots, when defined, are more or less lunularly sprinkled with blue scales.

Expanse, ♂  $4\frac{1}{2}$  to 6, ♀  $4\frac{3}{4}$  to  $5\frac{1}{2}$  inches.

We possess males of this form (*Androgeos*) from Sikkim; Jaintia Hills; Chittagong Hills, taken in October; Thoungoen and Tounghoo, Burma; and Mergui, Lower Tenasserim; and of the female (*Butlerianus*) from Bhamo, Burma, taken in November by Signor L. Fea. Males, taken in Beeling, Upper Tenasserim, in March and April, by Capt. E. Y. Watson, are in the British Museum.

Of our illustrations on Plate 447, fig. 1 is from a Jaintia Hill male, fig. 1a from an E. Bengal male; fig. 1b, a Darjiling female, and fig. 1c from a Jaintia Hill female.

**Form 3** (Plate 448, fig. 1, ♂, fig. 2, 2a, ♀).

*Papilio Phoenix*, Distant, Rhop. Malay. p. 340, pl. 27, B, fig. 7 (1885) ♀.

*Pap. Memnon Agenor* aber. *Phoenix*, Rothschild, Nov. Zool. ii. p. 319 (1895) ♀.

*Papilio Cilix*, Distant, *l.c.* p. 340, pl. 29, fig. 5, ♀.

*Pap. Mem. Agenor* aber. *primigenius*, Rothschild, *l.c.* p. 319 (1895) ♂.

Male (*primigenius*—fig. 1). Upperside rich dark blue-black. *Forewing* with the scarlet streak at base of cell slender; outer vein-streaks blue-grey scaled, cell streaks less apparent. *Hindwing* with very prominent pale bluish-grey vein-streaks, the intervening black streak sharply defined; four lower outer-marginal ovate black spots encircled with bluish-white, the first spot anal. Under-side. *Forewing* rich blue-black; the vein and cell streaks dark grey; basal cell-patch scarlet. *Hindwing* intense black; basal patch scarlet; with an anal, two lower submarginal, and three corresponding marginal completely grey-bordered black spots, the border of the anal and next spot being also slightly speckled with scarlet scales; the upper marginal spots incipient and partly grey-bordered, the upper submarginals lunularly

indicated by blue scales. In a second specimen (from Cherra Punji) the borders of the anal and two next submarginal spots and of the first marginal spot is thickly red-scaled.

Expanse, ♂  $4\frac{3}{4}$  to  $5\frac{1}{2}$  inches.

Female (*Phœnix*—fig. 2, 2a). Upperside. *Forewing* black; base of cell and a small streak below it scarlet; cell and vein streaks fuliginous-grey or olivescent-fuliginous, the latter sometimes palest posteriorly. *Hindwing* tailless; blue-black or olivescent bronze-black basally; with an anal and a lower marginal row of deep black spots, the latter being either almost quadrate, or elongated and partly coalesced with the outer black lunules; the lower discal area below the cell, from the lower subcostal veinlet to the abdominal margin is white traversed by black veins, the border of the anal and marginal spots being more or less thickly scarlet scaled; the upper discal area from within apex of the cell is either more or less distinctly blue-grey scaled, or but very few scales are present. Underside. *Forewing* black; cell and vein streaks paler; basal cell patch red. *Hindwing* intense black; basal patch red; marginal black spots and lower discal white area similar to the upperside, the anal spots being red-bordered, the anterior spots, when present, are grey-bordered and the upper one inwardly red-bordered.

Expanse, ♀  $5\frac{1}{2}$  to  $5\frac{3}{4}$  inches.

The type specimens of *primigenius*—the male we assign to this form—were obtained in the Khasia Hills, in April, 1889, by the Rev. W. A. Hamilton's native collectors, and are in Mr. W. Rothschild's collection. We have specimens of the female (*Phœnix*) from the Khasias, Sikkim, and Burma. Col. C. Swinhoe has the female from the Jaintia Hills.

Of our illustrations on Plate 448, fig. 1 represents the type male, named *primigenius*, from the Khasias; fig. 2 the female (*Phœnix*) is also from a Khasia specimen, and fig. 2a from a Sikkim specimen.

**Form 4** (Plate 449, fig. 1, 1a, ♀).

*Papilio Agenor*, Linnæus, Syst. Nat. ed. x. p. 460, ♀ (1758); *id.* Mus. Lud. Ulr. p. 194, ♀ (1764); *id.* Syst. Nat. ed. xii. p. 747, ♀ (1767). Clerck, Icones Ins. i. pl. 15, fig. *supr.* ♀ (1759). Fabricius, Syst. Ent. p. 446, ♀ (1775). Cramer, Pap. Exot. i. p. 52, pl. 32, fig. A, B, ♀ (1775). Jablonsky, Nat. Schmett. ii. p. 20, pl. 8, fig. 3, ♀ (1784). Esper, Aus. Schmett. p. 108, pl. 26, fig. 1, ♀ (1792). Donovan, Ins. China, pl. 24, fig. 2, ♀ (1798). Distant, Rhop. Malay. p. 339, pl. 29, fig. 1, ♀ (1885).

*Iliades Agenor*, Hübner, Verz. bek. Schmett. p. 89, ♀ (1816).

Female. Upperside. *Forewing* black; basal cell patch scarlet; cell and vein-streaks olivescent-fuliginous or greyish-fuliginous. *Hindwing* tailless, but in some specimens with a short pointed tooth at end of upper median veinlet; olivescent-

black or bluish-black basally and speckled with blue scales, the marginal spots deeper black; discal area—and sometimes slightly including apex of the cell—pure white or pale ochreous-white, the anal spot and first marginal spot being generally outwardly-bordered with ochreous, the others with grey speckled outer borders, and sometimes all these borders are pale ochreous. Underside. *Forewing* with paler cell and vein-streaks; basal cell patch scarlet. *Hindwing* bluish-black, not blue-speckled basally; marginal spots with more defined grey outer-borders; basal patch scarlet.

Expanse, ♀ 5 to 6 inches.

Examples of this form of female, from Moulmein, Tavoy, Upper Tenasserim, taken in July, and others from Hong Kong, are in the British Museum. Mr. H. Grose-Smith has it from the Daunat Range, Burma.

Of our illustrations on Plate 449, fig. 1 is from a specimen taken in the Daunat Range, Burma, and fig. 1a also from a Burmese example.

**Form 5** (Plate 449, fig. 2, 2a, ♀).

*Papilio Alcanor*, Cramer, Pap. Exot. ii. p. 107, pl. 166, fig. A, ♀ (1779). Esper, Aus. Schmett. p. 134, pl. 34, fig. 2, ♀ (1795).

*Achillides Alcanor*, Hübner, Verz. bek. Schmett. p. 85 (1816) ♀.

*Papilio Mem. Agenor* aber. *Alcanor*, Rothschild, Nov. Zool. ii. p. 320 (1895) ♀.

*Papilio Agenor*, Clerck, Icon. Ins. i. pl. 15, fig. *inf.* ♀ (1759).

*Papilio Achates*, Cramer (*nee* Sulzer), *l.c.* ii. p. 130, pl. 182, fig. A, B, ♀ (1779). Esper, *l.c.* p. 116, pl. 28, fig. 1, ♀ (1792). Butler, Trans. Linn. Soc. Zool. i. p. 553, ♂ ♀ (1877). Distant, Rhop. Malay. p. 342, pl. 28, fig. 3, 4, ♂, 5, ♀ (1885).

*Iliades Achates*, Moore, Journ. As. Soc. Bengal, 1889, p. 50, ♂ ♀.

*Papilio Alphenor*, Fabricius (*nee* Cramer), Spec. Ins. ii. p. 4, ♀ (1781). Jablonsky, Nat. Schmett. ii. p. 205, pl. 16, fig. 1, ♀ (1784).

*Pap. Mem. Agenor* aber. *Distantianus*, Rothschild, *l.c.* ii. p. 320 (1895) ♀.

Female. Upperside. *Forewing* black; basal cell-patch scarlet; cell and vein-streaks fuliginous, sometimes with whitish subapical area as in *Esperi*. *Hindwing* tailed; black or blue-black, in some greyish-black basally; with the fourth, third, or fully half of the cell, and a series of either four, five, or six adjoining discal elongate white patches, each disposed between the veins from the lower median upwards—occasionally, but very rarely, the cell patch is very small and the two central discal patches only are present; the submedian interspace is frequently also white basally; the discal patches are scarlet speckled outwardly; the borders of the anal rounded black spot, and the broad outer marginal lunules are also scarlet; the upper discal area and outer borders of the white discal patches, and also the entire submedian interspace when its white streak is absent, is more or less speckled with blue scales. Underside. *Forewing* paler; basal cell-patch scarlet; cell and vein-

streaks fuliginous-grey. *Hindwing* intense black or blue-black; the outer vein borders paler; basal patch scarlet; white apex of the cell, discal patches, anal spot and marginal lunules, as on the upperside, the red borders somewhat paler, and the upper lunules and their ciliæ being white or greyish-white, or these lunules are slightly red speckled. Abdomen with broad yellow-ochreous lateral bands.

Expanse, ♀  $5\frac{1}{2}$  to 6 inches.

Specimens of this form of female from the Khasia and Jaintia Hills; Shillong, Assam; Nepal; and Kyaikto, Tenasserim, the latter, taken in February, are in the British Museum. We have it from Nepal, taken by Gen. G. Ramsay; Rangoon and Tounghoo, Burma. The lower figure on Plate 15 of Clerck's *Icones*, evidently represents this form, with the tails broken off.

DISTRIBUTION.—This is “a very common species in Sikkim, and is found from April to December, from the Terai up to 5000 feet. The female is polymorphic, but three distinct forms may be defined, though each is more or less variable. The first form is tailless, and is more like the male; the second is also tailless, but has a large white patch on the hindwing; the third is tailed, and is marked with white spots on the disc of the hindwing. The second form of female is alone rare, the third form is the commonest of the three forms” (de Nicéville, *Sikkim Gazetteer*, 1894, 172). Mr. H. J. Elwes also records it as being “common in the lower valleys of Sikkim, and is found as high as 4000 to 5000 feet, from April until December. The common form of female is tailed, with a considerable amount of white in and beyond the cell of the hindwing; but tailless females are also found, without any white markings, and others with a broad white patch on the hinder margin of the forewing” (*Tr. Ent. Soc. Lond.* 1888, 428). Col. C. Swinhoe records it as “apparently very common in the Khasia Hills, in all its varieties” (*Tr. Ent. Soc. Lond.* 1893, 312). Mr. J. Wood-Mason obtained “forty-two males, six females (figured by Distant as female of *Mestor*, Hübn.), one female (*Agenor*, Cram.), eight females (*Alcanor* and *Achutes*, Cram.), in the forests and gardens in and around Silcurei, Iraungmara, the Doarband Pass, Ilasooria, and Rupacherra, in Cachar, where it was almost always to be seen from April 3rd to August 10th. On one occasion all four forms were seen on the wing together in a group, having evidently just emerged from the chrysalis state, and a specimen of each was taken. All the forms of this species are inodorous” (*Journ. As. Soc. Bengal*, 1886, 373). Capt. E. Y. Watson, during the Chin-Lushai Expedition of 1889-90, took “one male (form *Cilia*) at Tilin, in March, one male and two females (form *Mestor*) at Tilin, in November and March” (*Journ. Bombay N. H. S.* 1891, 53). Col. C. H. E. Adamson records “the forms of female *Agenor* and *Achates* as being common throughout Burma. The form *Mestor* having been taken only in the Bhamo District. The male is a very rapid flyer, while the females are heavy, sluggish flyers and easily captured” (*List*,

1897, 47). Capt. E. Y. Watson found it "common in Rangoon, and Beeling, Upper Tenasserim" (J. Bombay N. H. S. 1888, 26). Dr. J. Anderson obtained it in "Mergui in December and March; at Thaing, King Island, in February, and on Elphinstone Island in March" (Journ. Linn. Soc. Zool. 1886, 50). It also occurs in Siam; Malay Peninsula; Hainan; Hong Kong; Formosa; S. China.

The larva of this butterfly does not appear to have yet been found in India or Burma. The larva of the allied species (*I. Memnon*) feeds on *Citrus* (Order Rutaceæ).

**ILIADES MAYO** (Plate 450, fig. 1, 1a, ♂; 1b, ♀).

*Papilio Mayo*, Atkinson, Proc. Zool. Soc. Lond. 1873, p. 736, pl. 63, fig. 1, ♂. Moore, P. Z. S. 1877, p. 592. Oberthür, Etudes Ent. iv. p. 34 (1879). Wood-Mason and de Nicéville, Journ. As. Soc. Bengal, 1880, p. 237, ♂; *id.* 1881, p. 252, ♂ ♀. Staudinger, Exot. Schmett. i. p. 8 (1884). Haase, Untersuch. üb. Mim. p. 55, pl. 6, fig. 38, ♀, 39, ♂ (1893). Rothschild, Nov. Zool. ii. p. 322, ♂ ♀ (1895).

*Papilio Charicles*, Hewitson, Ann. and Mag. Nat. Hist. 1874, p. 356, ♀; *id.* Exot. Butt. v. *Pap.* pl. 14, fig. 45, ♀ (1875).

IMAGO.—Male. Upperside. Both wings rich purpurescent blue-black; cilia alternated slightly with white. *Forewing* generally with a more or less slightly-defined submarginal row of very short longitudinal ochreous-grey scaled streaks between the outer veins. *Hindwing* with a short tooth at end of the upper median veinlet; a transverse curved discal conspicuous cobalt-blue band, which is narrowest and broken at the costal end and extends to the abdominal margin above the anal angle, the band varying in width posteriorly from five-tenths to seven-tenths of an inch in its widest part, and is intersected by the black veins, its inner edges being curved and the outer edges sinuous. Underside. *Forewing* paler purpurescent blue-black; the crimson streak at base of the cell either slightly defined or absent; the submarginal short longitudinal streaks between the veins distinct and bluish-grey. *Hindwing* deep black; the crimson basal spots small and either slightly defined or distinct; with a transverse-discal curved row of blue-grey scaled lunules, the lower sometimes being more or less speckled with scarlet scales; an anal black spot either partly grey or scarlet bordered, and generally one, or two, lower-submarginal scarlet lunules. *Head* and thorax black; abdomen fuliginous-black; front of thorax white spotted; legs black above, greyish-white beneath; antennæ black.

Female. Upperside. Cilia alternated with white. *Forewing* fuliginous-black; with a large crimson basal cell patch; longitudinal cell-streaks fuliginous, outer vein-streaks paler fuliginous, broad, short, and extending from the median vein to one-third the outer margin. *Hindwing* intense black; with a large white cell-patch, three outer contiguous upper-discal smaller white spots, the upper one smallest, and

three short white streaks below the cell; outer-margin with broad scarlet spots, the upper lunular, the lower irregular shaped, the scarlet of the subanal sometimes extending upward in the lower median interspace and there enclosing a lengthened constricted black streak, which latter is either entire or broken; the submedian interspace from the angle for some distance upward is also scarlet and encloses a small black oval spot above the abdominal angle; end of the tail scarlet, the tip being white-scaled. Underside. *Forewing* pale olivescens-fuliginous; cell patch scarlet; cell-streaks olivescens-grey, vein-streaks, as in upperside, paler olivescens-grey and almost white posteriorly. *Hindwing* intense black; cell-spots scarlet; apex of cell and discal white markings, scarlet outer bordering, and tail tip, as on the upperside. *Abdomen* fuliginous-brown, paler laterally, and with pale ochreous-yellow apical segmental bands beneath.

Expanse, ♂ 5 to 5½, ♀ 5 to 6 inches.

HABITAT.—S. Andamans.

DISTRIBUTION.—The type specimens of both sexes were obtained at Port Blair, S. Andamans, by the native collector, Moti Ram; other specimens were also obtained by Mr. F. de Roepstorff.

**ILIADES POLYMNESTOROIDES** (Plate 451, fig. 1, ♂, 2, ♀).

Male. Upperside rich blue-black; cilia very slenderly alternated with white. *Forewing* with a transverse outer-discal row of short longitudinal pale greyish-blue scaled outer-vein streaks, these streaks being restricted uniformly towards the exterior margin, and decrease in width upward to the costa. *Hindwing* with a discal band formed of prominently defined pale greyish-blue scaled vein-streaks, these streaks decreasing to a point outwardly and do not reach the margin. Underside blue-black; base of both wings with the normal scarlet patch. *Forewing* with the vein-streaks paler, broader and longer than on the upperside, but uniformly terminate at some distance from the outer margin; cell streaks less defined. *Hindwing* with prominently grey-bordered submarginal and marginal black spots, the anal borders slightly tinged with red.

Female. Upperside. *Forewing* black, the basal area darkest; base of cell and a minute streak below it scarlet; vein borders and cell streaks pale fuliginous-grey. *Hindwing* greyish-black basally, the outer area fuliginous-grey, traversed by a marginal and submarginal series of greyish-black conical spots, the discal area and apex of cell being densely irrorated with greyish-blue scales. Underside. *Forewing* with greyish-white vein and cell-streaks; base of cell scarlet. *Hindwing* black, base scarlet; marginal and submarginal black spots broadly greyish-white bordered.

Expanse, ♂ 5, ♀ 6 inches.

HABITAT.—N. E. India.

DISTRIBUTION.—The type specimen of the male (fig. 1) was taken in the Jaintia Hills, Assam, by Col. Swinhoe's native collectors, and is now in the collection of Mr. W. Rothschild at Tring. The female (fig. 2) was taken by Mr. James Rothney, in Barrackpur Park, near Calcutta, in March, 1886, and is now in our own collection.

**ILIADES POLYMNESTOR** (Plate 452, fig. 1 *larva* and *pupa*, 1a, ♂, 1b, ♀).

*Papilio Polymnestor*, Cramer, Pap. Exot. i. p. 83, pl. 53, fig. A, B, ♂ (1775). Goeze, Ent. Beytr. iii. 1, p. 83 (1779). Fabricius, Spec. Ins. ii. p. 9 (1781). Jablonsky, Nat. Schmett. ii. p. 11, pl. 7, fig. 3, ♀ (1784). Esper, Ausl. Schmett. p. 77, pl. 19, fig. 1 (1785). Donovan, Ins. of India, pl. 20, fig. 2, ♀ (1800). Godart, Eney. Méth. ix. p. 29 (1819). Lucas, Lep. Exot. p. 21, pl. 12, fig. 1 (1835). Boisl. Spec. Gén. Lep. i. p. 191 (1836). Doubleday and Hewitson, Gen. D. Lep. i. p. 10 (1846). Chenu, Eney. Hist. Nat. Pap. pl. 3, fig. 2 (1851). Moore, Catal. Lep. Mus. E. I. Company, i. p. 101, pl. 3, fig. 1, 1a *larva* and *pupa* (1857); *id.* P. Z. S. 1865, p. 756. Butler, Catal. Fabr. Lep. B. M. p. 256 (1869). Staudinger, Exot. Schmett. i. p. 8 (1884). de Nicéville, Journ. As. Soc. Bengal, 1885, p. 51. Elwes, Tr. Ent. Soc. Lond. 1888, p. 430. Davidson and Aitken, Journ. Bombay N. H. Soc. 1890, p. 366. Betham, *ib. l.c.* 1892, p. 325. Rothschild, Nov. Zool. ii. p. 324 (1895).

*Iliades Polymnestor*, Hübner, Verz. bek. Schmett. p. 88 (1816). Swinhoe, P. Z. S. 1885, p. 144.

*Papilio (Iliades) Polymnestor*, de Nicéville, Journ. As. Soc. Bengal, 1885, p. 51. Ferguson, Journ. Bomt. N. H. Soc. 1891, p. 446.

IMAGO.—Male. Upperside rich blue-black; cilia alternated with white. *Forewing* with a transverse discal pale bluish-grey scaled interrupted band composed of short longitudinal streaks between the veins, these streaks being most intense and widest posteriorly, and decreasing both in width and length anteriorly, where they obsolescently terminate at the lower subcostal branch. *Hindwing* with the outer area, from a fourth, or third, of the apex of the cell, pale greyish-blue, crossed by a curved discal series of seven black spots, situated between the veins, these spots being either oval or broadly conical; followed by a submarginal similar row of spots and then a marginal row of angled spots, these latter being at the vein ends decreasing anteriorly in width, and sometimes there partly coalesce with the opposite submarginal spot. Underside duller blue-black. *Forewing* with a crimson basal cell streak; discal vein-streaks extending anteriorly to the costa, these being dull ochreous-grey anteriorly and bluish-grey posteriorly. *Hindwing* with crimson basal patches; the outer discal area, from beyond the cell, dull ochreous-grey, traversed by the discal, submarginal, and marginal black spots, as on upperside.

Female. Upperside. *Forewing* duller black, in some fuliginous-black, with the cell streaks and that between the veins black; the discal streaks paler bluish-grey; base of cell sometimes sparsely speckled with crimson scales. *Hindwing* similar to

the male; the outer area slightly paler bluish-grey. Underside paler than male, duller black. *Forewing* with crimson basal streak, the cell and vein-streaks paler than on upperside. *Hindwing* with basal crimson spots; outer area similar to male, but paler. *Body*, legs, and antennæ black; femora beneath greyish.

Expanse, ♂  $5\frac{1}{2}$  to  $5\frac{3}{4}$ , ♀ 6 to  $6\frac{1}{4}$  inches.

LARVA AND PUPA.—(See Plate 452, fig. 1.)

HABITAT.—South, Central, and Eastern India; Sikkim; Burma.

DISTRIBUTION, HABITS, &c.—“Common in the Kanara District of Bombay, wherever the country is sufficiently wooded, most so about September to October. The favourite food of the larva being a Wild Lime, which occurs in all the forests” (Davidson and Aitken, Journ. Bombay N. H. S. 1896, 580). “We noticed this butterfly at Matheran, in March, laying its eggs on a Lime tree in the garden. In Karwa, we reared a great many in September and October, on a common wild orange (*Atalantia* sp.); another favourite food appeared to be *Garcinia Xanthochymus*. In form, colour, and markings the larva is very similar to that of *P. Polytes* and *P. Erithonius*, but the enlargement on the 4th and 5th segments is much exaggerated, especially after the last moult. In the pupa, the headcase and its two projecting points are more elongated” (*ib. l.c.* 1890, 376). “The food-plants of the larva, according to the observations of Messrs. Davidson, Aitken and Bell, are *Paramignya monophylla* and *Atalantia monophylla*; Order Rutaceæ” (de Nicéville, J. As. Beng. 1900, 258). Col. C. Swinhoe obtained this butterfly on Matheran, Parbutti Hill, Poona, Bombay, in November” (P. Z. S. 1885, 144). It is “fairly common in the neighbourhood of Koonoor, but avoids the sunlight, and flutters softly about in the deep gloom of the most secluded groves of Fig and Mango trees. When feeding they are so absorbed that they may be taken between the thumb and finger without much difficulty” (E. L. Arnold, Ent. Mo. Mag. 1880, 137). Mr. G. F. Hampson obtained it on the “Nilgiris, from 2000 to 7000 feet” (J. As. Soc. Beng. 1888, 364). Mr. S. N. Ward writes, “Found at all heights from the top of the Nilgiris and Shevaroyes to the coast. It is commonest during the monsoon, but I have seen it in first locality in April” (MS. Notes). Mr. H. S. Ferguson found it “common in Travancore, more so in the low country than in the Hills” (J. Bombay N. H. S. 1891, 446). Lieut. E. Y. Watson took it in “Madras, in June” (J. As. Soc. Beng. 1890, 268). Mr. W. C. Taylor records it as “rather common at Khorda, in Orissa” (List, 1888, 16). Mr. Betham obtained it in the Central Provinces (J. Bombay N. H. S. 1892, 325). Mr. W. S. Atkinson records it as “not uncommon in the Plains of Southern Bengal, west of the Ganges; but does not reach the Hills” (MS. Notes). Mr. L. de Nicéville says it “occurs in the neighbourhood of Calcutta throughout the hot weather, first appearing at the end of March. I have bred the larva on Pomelo (*Citrus decumana*)” (J. As. Soc. Beng.



1885, 51). Mr. H. J. Elwes records "a single specimen of the female taken in Sikkim in 1887, by Mr. O. Möller's collectors—probably a straggler from the Plains" (Tr. Ent. Soc. 1888, 430). Mr. E. Blyth, writing from Paphoon, on the Yunzalin River, a tributary to the Salween, Burma, says, "I twice saw this fine butterfly (*Polymnestor*), which I had hitherto only seen from Lower Bengal" (J. As. Soc. Beng. 1861, 392).

**ILIADES PARINDA** (Plate 453, fig. 1, larva and pupa, 1a, ♂, 1b, c, ♀).

*Iliades Parinda*, Moore, Lep. of Ceylon, i. p. 148, pl. 60, fig. 1, ♂, 1a, ♀, 1b, c, larva and pupa (1881).

*Papilio Polymnestor Parinda*, Rothschild, Nov. Zool. ii. p. 330 (1895).

IMAGO.—Male. Upperside similar to *I. Polymnestor*. Forewing with the pale bluish-grey band somewhat broader posteriorly. Hindwing with the pale bluish-grey outer area usually extending from across middle of the cell. Underside similar to *Polymnestor*. Forewing with the outer vein-streaks more distinctly ochreous anteriorly. Hindwing with the outer discal area more distinctly ochreous.

Female. Upperside. Forewing fuliginous-black; with the cell and outer vein streaks pale greyish-ochreous, the latter palest or ochreous-white hindward, being longer and broader than in same sex of *Polymnestor*, those from the middle median upward are united at their base, and extend inward to the cell; basal cell patch crimson. Hindwing similar to the male, except that the outer area is paler, and inwardly more or less tinged or clouded with pale ochreous. Underside. Basal patches dark crimson. Forewing with the cell-streaks and the vein-streaks pale greyish-ochreous, the latter longer and extend inward to the cell from the lower median. Hindwing with the outer area, from within apex of the cell, more uniformly tinted with pale ochreous than on the upperside.

Expanse,  $5\frac{1}{2}$  to 6 inches.

LARVA.—Smooth, glossy-green; with a whitish lateral lower band from sixth to anal segment, a broad similar coloured band obliquely ascending the eighth and ninth, and a similar band on the tenth segment; anterior shield edged with white, its posterior dorsal end bordered by a transverse blackish-marked crest, a similar crest also across the fourth segment ending on each side in a large ocellated spot. Feeds on *Citrus decumana*.

PUPA.—Green or olive-brown.

DISTRIBUTION AND HABITS.—"An abundant species in the low country and lower hill districts in Ceylon. The females are much rarer than the males. It is a very conspicuous insect on the wing. The larva feeds on Rutaceæ, especially on the plants of the genus *Citrus*" (Dr. N. Manders, J. As. Soc. Beng. 1899, 222). Mr.

F. M. Mackwood states that it is "found all over the island, predominating in the low country. March and April the principal time for emergence from chrysalis. Very difficult to capture perfect." Capt. F. J. Hutchison says, "Western Central and Southern provinces of the island, both Plains and Hills, in forest and open ground. Taken at Colombo from April to end of December; elsewhere at various times. It has a slow majestic flight; flaps the wings a great deal. Is quite fearless and easily caught hovering over flowers." Capt. H. Wade obtained it at "Kandy and Galle." Sir J. E. Tennent (Nat. Hist. Ceyl. 425) says the butterfly "darts rapidly through the air, alighting on the ruddy foliage of the *Hibiscus*, or the dark green foliage of the *Citrus*, on which it deposits its eggs. The larva has a hump on the fourth or fifth segment, and from this hump, on being irritated, it protrudes a horn of an orange colour, bifurcate at the extremity, and covered with a pungent mucilaginous secretion, and strikes it upon the offending object with unerring aim" (Lep. Ceylon i. 149).

INDO-MALAYAN SPECIES.—*Iliades Memnon* (Papilio Memnon, Linn. Syst. Nat. ed. x. p. 460, ♂ (1758). Cramer, Pap. Exot. i. p. 142, pl. 91, fig. C, ♂ (1776). Sulzer, Gesch. Ins. p. 141, pl. 12, fig. 5, ♂ (1776). Jablonsky, Nat. Schmett. i. p. 210, pl. 6, fig. 2, 3, ♂ (1783). Rømer, Gen. Ins. Linné, p. 17, pl. 12, fig. 5, ♂ (1789). Esper, Ausl. Schmett. p. 86, pl. 20, fig. 3, ♂ (1790). Godart, Enc. Méth. ix. p. 29 (1819). Horsfield, Catal. Lep. Mus. E. I. Company, i. pl. 3, fig. 3, 3a, larva and pupa (1828). Swainson, Zool. Illust. iii. pl. 95 (1833). Boisd. Spec. Gén. Lep. i. p. 192 (1836). De Haan, Verh. N. G. Ned. pl. 3, fig. 2, 3, ♀ (1840). Doubleday and Hewitson, Gen. D. Lep. i. p. 10 (1846). Wallace, Tr. Linn. Soc. xxv. p. 46, pl. 1, fig. 1, ♂, 2, 3, 4, ♀ (1865). Piepers, Tijds. v. Ent. 1888, p. 350, pl. 8, fig. 5, larva. de Nicéville, Journ. As. Soc. Bengal, 1895, p. 515, ♂ ♀. Rothschild, Nov. Zool. ii. p. 312 (1895). *Iliades Memnon*, Hübn. Verz. bek. Schmett. p. 89, ♂ (1816). *Syn. Pap. atrovenatus*, Goeze, Ent. Beyt. iii. 1, p. 44 ♂ (1799). Seba Thes. iv. pl. 16, fig. 10, 11, ♂ (1765). *Pap. Achates*, Sulzer, Gesch. Ins. p. 141, pl. 12, fig. 2, ♀ (1776). Cramer, *l.c.* iii. p. 84, pl. 243, fig. A, ♀ (1782). Jablonsky, *l.c.* ii. p. 179, pl. 15, fig. 1, ♀ (1784). Rømer, *l.c.* p. 68, pl. 12, fig. 2, ♀. *Pap. Laomedon*, Cramer, *l.c.* i. p. 78, pl. 50, fig. A, B, ♀ (1776). *Pap. Anceus*, Cram. *l.c.* p. 44, pl. 222, fig. A, B, ♀ (1792). Jablonsky, *l.c.* ii. p. 15, pl. 8, fig. 1, ♀ (1784). Esper, *l.c.* p. 135, pl. 35, fig. 1, ♀ (1788). *Pap. Achatiaides*, Esper, *l.c.* p. 118, pl. 18, fig. 2, ♀; pl. 29, fig. 1, ♀ (1786). *Pap. Arbates*, Zink.-Som. Nov. Act. Acad. N. C. xv. p. 151, ♂ (1831). *Pap. Memnon var. Javanus et Erebinus*, Haase, Untersuch. üb. Mim. p. 57, ♀ (1894). *Pap. Mem. aber. Sericatus*, Fruhstorfer, Berl. Ent. Zeit. 1898, p. 427, ♂. *Note*.—Dr. L. Martin records having "frequently bred *Pap. Memnon*, and obtained all four forms of the female from eggs laid by one mother. In another case four eggs deposited by a tailed female of form 4, did not yield a

single tailed descendant like herself" (Journ. As. Soc. Bengal, 1895, 516). *Habitat.* Java; Sumatra; Nias; Natuna Isles; Borneo.—*Iliades Oceani* (Pap. Iliades Oceani, Doherty, Journ. As. Soc. Bengal, 1891, p. 31, ♂ ♀. Pap. Memnon Oceani, Rothschild, Nov. Zool. ii. p. 315. *Habitat.* Engano Island.—*Iliades Thunbergii* (Pap. Thunbergii, Siebold, Hist. Nat. Japon, p. 16, ♂ (1824). *Habitat.* S. Japan. *Iliades Pryeri* (Pap. Mem. subsp. Pryeri, Rothschild, Nov. Zool. ii. p. 321, ♂ ♀ (1895). Pap. Memnon, var. De Haan, Verh. Nat. Ned. p. 24, pl. 3, fig. 1, ♂ (1840). Pryer, Rhop. Nip. pl. 2, fig. 1, ♀ (1886). Leech, Butt. of China, &c., p. 545, ♂ ♀ (1893). Rothschild, *l.c.* p. 321 (1895). *Habitat.* Loo Choo Islands.—*Iliades Lowii* (Pap. Lowii, Druce, P. Z. S. 1873, p. 358, pl. 33, fig. 6, ♂. Rothschild, *l.c.* p. 321 (1895). *Habitat.* Palawan; Philippines.—*Iliades Rumanzoria* (Pap. Rumanzovia, Eschscholtz, Kotzebue's Reise, iii. p. 204, pl. 2, fig. 4a, b, ♀ (1821). Thon, Nat. Schmett. p. 17, pl. 5, fig. 6, 7, ♀ (1837). Semper, Phil. Tagf. p. 279, pl. B, fig. 9 (1892). Rothschild, *l.c.* p. 322, ♂ ♀ (1895). *Syn.* Pap. Krusensternia, Esch. *l.c.* p. 205, pl. 3, fig. 5a, b, ♂ (1821). Iliades Emalthion, Hübner, Samml. Ex. Schmett. ii. pl. 117, ♂ (1822). Pap. Emalthion, Gray, Catal. Lep. B. M. i. p. 14, pl. 5, fig. 4 ♀ (1852). Pap. Floridor, Godart, Enc. Méth. ix. Suppl. p. 809, ♂ ♀ (1823). Pap. Descombesii, Roger, Bull. Soc. Linn. Bord. i. (1826). Pap. Semperinus, Haase, Unters. üb. Mim. p. 55, ♀ (1893). *Habitat.* Philippine, Sulu, Sangir, and Talaut Isles.—*Iliades Lampsacus* (Pap. Lampsacus, Boisd. Spec. Gén. Lep. i. p. 190 (1836). De Haan, Verh. Nat. Gesch. Ned. p. 23, pl. 2, fig. 2 (1840). Rothschild, *l.c.* p. 330 (1895). *Habitat.* Java.—*Iliades Forbesi* (Pap. Forbesi, Grose-Smith, Ann. N. H. 1883, p. 234; *id.* Rhop. Exot. i. Pap. pl. 1, fig. 1, 2, ♂ (1885). Martin, Tijd. v. Ned. Ind. 1893, p. 4, ♂ ♀. de Nicéville, Journ. As. Soc. Bengal, 1895, p. 517, ♂ ♀. Rothschild, *l.c.* p. 331 (1895). *Habitat.* Sumatra.—*Iliades Acheron* (Pap. Acheron, Grose-Smith, Ann. N. H. 1887, p. 432, ♂; *id.* Rhop. Exot. i. Pap. pl. 5, fig. 1, 2, ♂ (1888). Rothschild, *l.c.* p. 321 (1895). *Habitat.* N. Borneo.

#### Genus CHARUS.

*Charus*, Moore, Lep. of Ceylon, i. p. 149 (1881).

*Papilio* (part), Doubleday and Hewitson, Gen. D. Lep. i. p. 5 (1846).

*Papilio* (sect. 60, subsect. B), Felder, Verh. Z. B. Ges. Wien. pp. 319, 367 (1864).

*Papilio* (group 6), Rothschild, Nov. Zool. ii. p. 282 (1895).

IMAGO.—*Forewing* shorter, broader, and more regularly triangular than in *Iliades*; costa much arched in the middle; cell much broader; exterior margin very slightly scalloped; outer area of upperside in the male clothed with very fine short hairs so densely as to conceal the scales beneath. *Hindwing* comparatively shorter and more triangular in shape, being less produced hindward; exterior margin more

deeply scalloped; tailed in both sexes; basal area of upperside very hairy. Antennal club shorter; hind tibia slender, with rows of short fine spines. Sexes similar.

LARVA AND PUPA.—Similar to *Iliades*.

TYPE.—C. Helenus.

**CHARUS HELENUS** (Plate 454, fig. 1, 1a, b, ♂, 1c, ♀).

*Papilio Helenus*, Linnæus, Syst. Nat. x. p. 459 (1758); *id.* xii. p. 745 (1767). Clerck, Icones Ins. i. pl. 13, fig. 2 (1759). Linn. Mus. Ulr. p. 185 (1764). Houtt. Nat. Hist. i. 2, p. 191, pl. 87, fig. 1 (1767). Müller, Naturf. v. p. 567, pl. 17, fig. 1 (1774). Fabricius, Syst. Ent. p. 443 (1775). Cramer, Pap. Exot. ii. p. 90, pl. 153, fig. A, B (1777). Esper, Ausl. Schmett. p. 18, pl. 2, fig. 2 (1784). Jablonsky, Nat. Schmett. ii. p. 166, pl. 14, fig. 4, ♂ (1784). Godart, Encyc. Méth. ix. p. 68 (1819). Boisduval, Spec. Gén. Lep. i. p. 211 (1836). Doubleday and Hewitson, Gen. D. Lep. i. p. 11 (1846). Moore, Catal. Lep. Mus. E. I. C. i. p. 101 (1857); *id.* Proc. Zool. Soc. 1865, p. 757; *id.* 1878, p. 840. Butler, Tr. Linn. Soc. Lond. Zool. i. p. 553 (1877-9). de Nicéville, Journ. As. Soc. Bengal, 1881, p. 59. Elwes, Proc. Zool. Soc. 1881, p. 873; Tr. Ent. Soc. 1888, p. 429. Aurivillius, Kongl. Sv. Vet. Akad. Handl. 1882, p. 10. Staudinger, Exot. Schmett. i. p. 7 (1884). Distant, Rhop. Malay. p. 343, pl. 29, fig. 3, ♂ (1885). Manders, Tr. Ent. Soc. 1890, p. 536. Leech, Butt. of China, ii. p. 548 (1893). Oberthür, Etud. Ent. xvii. p. 4 (1893). Rothschild, Nov. Zool. ii. p. 284 (1895).

*Achillides Helenus*, Hübner, Verz. bek. Schmett. p. 85 (1816).

*Charus Helenus*, Moore, Journ. Linn. Soc. Zool. 1886, p. 51. Swinhoe, Tr. Ent. Soc. Lond. 1893, p. 312.

*Papilio (Charus) Helenus*, Doherty, Journ. As. Soc. Bengal, 1886, p. 137. Elwes and de Nicéville, *ib.* 1886, p. 436. Watson, Journ. Bombay N. H. Soc. 1891, p. 54. de Nicéville, Sikkim Gaz. 1894, p. 172.

*Papilio Helenus*, *aber. rufatus*, Rothschild, Nov. Zool. ii. p. 286 (1895).

IMAGO.—Male. Upperside rich brownish-black; cilia alternated with white. *Forewing* with slender longitudinal streaks of golden-yellow scales within the cell, and hairy-scaled broad streaks between the outer veins; lower base of the wing also sparsely speckled with golden-yellow scales. *Hindwing* with a cream-white upper discal patch composed of three portions, a short almost quadrate portion in the costal interspace, and two lower large elongate portions in the subcostal interspaces, a few white or grey scales also being present below the lower portion; at the anal angle is a dark purple-red circle which generally partly encloses a round black spot, followed by a lower submarginal series of three, sometimes four, more or less apparent purple-red incurved lunules, the first or lower one sometimes forming a circle round a black spot; in some specimens the lower lunule is obsolescent, in others all the latter are obsolete. Underside paler. *Forewing* with prominent greyish-white scaled slender cell-streaks and broad outer vein-streaks. *Hindwing* with the upper basal area speckled with greyish-white scales, and three similar scaled slender longitudinal streaks within the cell, the base of the median and

submedian vein also being white scaled; upper discal white patch composed of three smaller portions than on the upperside; anal ocellus and a complete series of submarginal lunules dark red; an inner subanal confluent lunule also present in the lower median interspace; the anal and subanal lunules being speckled with violet-blue scales; beyond is a marginal row of more or less defined red-and-white scaled lunules.

Female. Upperside and underside similar to the male, except that the base of the hindwing is paler.

*Body* brownish-black; collar, front of head and palpi white-spotted; tegulæ white fringed; legs and antennæ black.

Expanse, ♂ 4 to  $5\frac{1}{2}$ , ♀ 5 to  $5\frac{1}{4}$  inches.

HABITAT.—W. and E. Himalayas; Khasias; Burma; Tenasserim; Malay Peninsula; Siam; Hong Kong; S. China; Hainan.

DISTRIBUTION.—In the Western Himalaya Mr. P. W. Mackinnon took "a single specimen of the male in the Dehra Dun, in April, this being the most westerly point from which it has been recorded" (J. Bombay N. H. S. 1898, 592). Mr. W. Doherty obtained it in the "Kali Valley, Divaliserā, Kumaon, at 2000 feet elevation; scarce." Gen. G. Ramsay obtained it in Nepal (J. As. S. Bengal, 1886, 137). Mr. H. J. Elwes found it "one of the commonest species of *Papilio* in Sikkim at all elevations up to 5000 or 6000 feet, but most numerous in the low valleys from April to October" (Tr. Ent. Soc. 1888, 429). Mr. de Nicéville also records it as "found in Sikkim throughout the summer, commonly at the lower elevations and as high as 6000 feet" (Sikkim Gaz. 1894, 172). Col. C. Swinhoe says it is "apparently a rare species in the Khasia Hills, two examples from Shillong only, been received" (Tr. Ent. Soc. 1893, 312). Mr. J. Wood-Mason obtained fourteen males and three females in the forests around Silcūri, Cachar, from May 7th to August 20th" (J. As. Soc. Beng. 1886, 375). Col. C. H. E. Adamson says it is "common in Burma wherever there is forest land" (List, 1897, 47). Capt. E. Y. Watson found it not "uncommon during the dry-season, January to June, in the Chin Hills, Burma, up to 4000 feet elevation" (J. Bombay N. H. S. 1897, 651). Signor L. Fea obtained it in the Karen Hills, at Bhamo, in October, and at Meteleo in August and September. Dr. N. Manders found it "abundant in the Shan States, but difficult to secure in good condition, as it has a habit of flying in and out of bushes and soon tatters" (Tr. Ent. Soc. 1890, 536). Mr. O. Limborg obtained it at Hatseiga, and on the road from Moolai to Moolat, at 4000 feet elevation" (P. Z. S. 1878, 840). "Several males were taken at Ponekai, Tavoy, and a few in the Hills on the Siam frontier" (J. As. S. Beng. 1886, 436). Dr. J. Anderson took it on "Owen Island, Mergui Archipelago, in January" (J. Linn. Soc. Zool. 1886, 51). In Hong Kong, Mr. J. J. Walker, R.N., found it "a very common butterfly, of which stragglers are met with in December and January,

and fresh examples were observed in February. The flight is strong, undulating, and very erratic, and it is by no means easy to secure in good condition. The larva is found not rarely on the leaves of various Aurantiaceæ" (Tr. Ent. Soc. 1895, 469).

**CHARUS DAKSHA** (Plate 455, fig. 1, larva and pupa, 1a, ♂, 1b, ♀).

*Papilio (Charus) Daksha*, Moore, Journ. As. Soc. Bengal, 1888, p. 363.

*Papilio Daksha*, Davidson and Aitken, Journ. Bombay N. H. Soc. 1896, p. 580, pl. 6, fig. 3, 3a, larva and pupa.

*Papilio Helenus Daksha*, Rothschild, Nov. Zool. ii. p. 286 (1895). de Nicéville, Journ. As. Soc. Beng. 1900, p. 258.

*Papilio Helenus*, Moore, Catal. Lep. Mus. E. I. C. i. pl. 3, fig. 2, 2a, larva and pupa (1857). Swinhoe, P. Z. S. 1885, p. 145. Davidson and Aitken, Journ. Bombay N. H. Soc. 1890, p. 367.

*Papilio (Charus) Helenus*, Ferguson, Journ. Bombay N. H. S. 1891, p. 447.

IMAGO.—Male and female differs from *C. Helenus* in the shorter and more triangular form of the forewings. Male. Upperside. *Hindwing* with the three portions of the upper discal creamy-white patch much wider, the upper portion being twice the width of that in *Helenus*, the lower portion extending to the discocellular veinlet, and generally also along its edge within the cell, the lower portion also having a cluster of greyish-white scales decreasingly extending to near the lower median veinlet; anal and the submarginal red lunules similar, the anal with an upper bordering of blue scales. Underside. *Forewing* with the greyish-white outer vein-streaks shorter than in *Helenus*, crossing the discal area midway between end of the cell and the exterior margin. *Hindwing* with the discal white patch wider; and generally there are two lower-discal additional red lunules present between the subanal and the white patch.

Female. Upperside somewhat paler than in the male. Underside also paler. *Forewing* with the pale vein-streaks inwardly more distinct. *Hindwing* similar to the male.

Expanse, ♂  $4\frac{3}{4}$  to 5, ♀ 5 to  $5\frac{1}{2}$  inches.

HABITAT.—South India.

LARVA AND PUPA.—(See Plate 455, fig. 1.)

DISTRIBUTION, ETC.—“This butterfly may be met with in the Kanara District of Bombay, wherever the country is sufficiently wooded, in the same situations as *Polymnestor*, and at any time of the year, but is not nearly so numerous” (Davidson and Aitken, J. Bombay N. H. S. 1896, 580). “We got one larva of this butterfly on the Tirphal (*Zanthoxylum Rhetsa*), a horribly thorny tree, leafless in the dry season. The larva has the 4th and 5th segments even more tumid than in *Polymnestor*, forming a broad and high hump, nearly flat on the top, and bounded before and behind by rugged ridges of a whitish or pale grey colour, chequered with fine brown

lines, the anterior ridge ending in a large black and white ocellus on each side. The pupa was distinguishable from that of *Polymnestor* chiefly by the two projecting points on the head being somewhat curved upwards" (*ib. l.c.* 1890, 367). The larva also "feeds on *Citrus decumana* and *Citrus medica*" (de Nicéville, J. As. S. Bengal, 1900, 258). Mr. S. N. Ward, in his MS. Notes, writes, "It is found from the top of the Nilgiris and Shevaroy's to the coast on both sides, chiefly after the monsoon. It likes the forest and may be seen early over the trees low down on the mountain passes. Like *Polymnestor* it is fond of hovering about watery and muddy places. The larva feeds on the Orange and Lime, but is exceedingly difficult to find." It is "common on the Nilgiris from 1000 to 7000 feet elevation. The larva feeds on Orange, and has the power of protruding two pink horns from the head with a delicious scent. It will always do this if taken up by a pair of scissors, or by the beak of a bird" (G. F. Hampson, *l.c.* 363). Mr. H. S. Ferguson records it as "common in the Travancore Hills from 2000 feet upwards" (J. Bombay N. H. S. 1891, 446). Col. C. Swinhoe took it in Poona, Bombay (P. Z. S. 1885, 145).

Our illustrations of the larva and pupa on Plate 455 are from the late Mr. S. N. Ward's original drawings.

#### CHARUS MOOREANUS.

*Papilio Helenus Mooreanus*, Rothschild, Nov. Zool. ii. p. 286 (1895).

*Charus Helenus*, Moore, Lep. of Ceylon, i. p. 149, pl. 58, fig. 3, ♂ (1881).

IMAGO.—Upperside brownish-black. *Forewing* with sparsely irrorated golden-yellow scaled streaks within the cell and between the outer veins. *Hindwing* with a broad pale yellow upper-discal patch, which has an irregular outer border; an indistinct crimson slender lunule above anal angle, and other lower-submarginal lunules, these latter being more distinct in the female; a few yellow scales on the disc below the patch. Underside. *Hindwing* with the discal white patch as above, and a complete series of seven subdiscal blue lunules, of which the three anterior stand at the outer edge of the white discal patch, and the two posterior are situated within the anal and subanal rufous spots.

Expanse,  $4\frac{1}{2}$  to  $5\frac{1}{2}$  inches.

HABITAT.—Ceylon.

DISTRIBUTION.—Mr. F. M. Mackwood says this butterfly is "found principally in open glades, and roadways in the jungle, from about 2000 to 4000 feet elevation. Capt. Wade took it at Kandy, Ambogamma and in the Kottowa forest. It frequents high jungle only, in suitable country; not uncommon" (Lep. Ceylon, i. 149). Dr. N. Manders records it as "a very common insect in Ceylon, at all elevations, but especially so in the low country" (J. A. S. Beng. 1899, 222).

**CHARUS ISWARA** (Plate 453, fig. 1, ♂, 1a, ♀).

*Papilio Iswara*, White, Entom. i. p. 280 (1842). Doubleday and Hewitson, Gen. D. Lep. i. p. 11, pl. 2, fig. 1 (1846). Gray, Catal. Lep. B. M. i. p. 19 (1852). Moore, Catal. Lep. Mus. E. I. C. i. p. 101 (1857). Felder, Verh. Z. B. Ges. Wien. p. 320 (1864). Wallace, Trans. Linn. Soc. Lond. 1865, p. 51. Butler, *ib.* 1877, p. 553. Distant, Rhop. Malay. p. 344, pl. 30, fig. 1, ♂, 2, ♀ (1885). Hagen, Berl. Ent. Zeit. 1892, p. 154; *ib.* Iris, 1894, p. 21. Rothschild, Nov. Zool. ii. p. 288 (1895).

*Charus Iswara*, Moore, Journ. Linn. Soc. Lond. Zool. 1886, p. 51.

IMAGO.—Male. Upperside rich brownish-black; cilia slightly alternated with white. *Forewing* with slender longitudinal golden-yellow scaled cell streaks and hairy-scaled broader outer vein-streaks, the latter palest posteriorly; lower base of the wing also golden-yellow scaled. *Hindwing* with a large broad creamy-white upper-discal patch composed of four portions; the outer edge of the lower portion not sharply-defined, but thickly white scaled, and with a decreasing cluster of similar scales extending from its lower edge; an incurved anal and a lower marginal lunule dark crimson. Underside. *Forewing* duller coloured, bluish-black; cell streaks prominent and bluish-grey; vein streaks short, broad, bluish-grey and uniformly restricted midway across the wing. *Hindwing* blue-black; upper basal area speckled with grey scales; cell streaks and base of the veins grey-scaled; the upper-discal white patch as above, but not so broad, and followed by two lower small more-or-less-defined white or greyish-white scaled lunular spots placed in the median interspaces; a large dark red anal incomplete ocellus and a red lower marginal complete ocellus, the former being inwardly bordered with blue scales, and followed by three lower-discal blue-scaled lunules; outer margin with a slender white ciliary-lunule between the veins, the upper being somewhat wider.

Female. Upperside. *Forewing* brownish-black, the cell and vein-streaks paler, the latter more distinct, and fuliginous-grey posteriorly. *Hindwing* with similar large discal white patch as in male, but with its anterior portion shorter, the lower decreasing cluster of white scales prominent; a large dark crimson anal and a lower marginal ocellate-spot. Underside. *Forewing* paler; similar to the male. *Hindwing* also similar to the male, except that the two lower-discal white-scaled lunules are larger, and the red anal and lower marginal ocellate-spot complete, their black centre being smaller. *Body* brownish-black; front of thorax and head white spotted; abdomen with a lateral row of white dots and longitudinal whitish scaled streaks.

Expanse, ♂ 5 to  $5\frac{3}{4}$ , ♀  $5\frac{3}{4}$  inches.

HABITAT.—Lower Tenasserim; Malay Peninsula; Sumatra; Banka; Billiton.

DISTRIBUTION.—Within our area, specimens were obtained by Dr. J. Anderson in



“Mergui, in December, and on Kisserang Island in January” (J. Linn. Soc. Zool. 1886, 51).

Of our illustrations on Plate 456, fig. 1 is from a Mergui male, and fig. 1a from a Malacca female.

INDO-MALAY SPECIES.—*Charus Niconicolens* (Papilio Niconicolens, Butler, Ann. Nat. Hist. 1881, p. 139. Pap. Helenus Niconicolens, Rothschild, Nov. Zool. ii. 287 (1895). *Habitat.* S. Japan; Loo Choo Isles.—*Charus Palawanicus* (Pap. Helenus var. Palawanicus, Staudinger, Iris, i. p. 278 (1888); ii. p. 12 (1889). Rothschild, *l.c.* p. 287 (1895). Pap. Helenus var. Enganius, Doherty, Journ. As. Soc. Bengal, 1891, p. 31. *Habitat.* Java; Sumatra; Nias; Engano; Borneo; Palawan.—*Charus Hystaspes* (Pap. Hystaspes, Felder, Wien. Ent. Monats. 1862, p. 283; Reise Novara, Lep. i. p. 105, pl. 15, fig. C (1865). Semper, Phil. Tagf. p. 274 (1892). *Syn.* Pap. Varasi, Reakirt, Proc. Ent. Soc. Philadelphia, 1864, p. 465. *Habitat.* Philippines.—*Charus Araspes* (Pap. Araspes, Felder, Wien. Ent. Monats. 1859, p. 321; Reise, Nov. Lep. i. p. 108, pl. 15, fig. A (1865). Semper, Phil. Tagf. p. 275. Fruhstorfer, Berl. Ent. Zeit. 1898, p. 421. *Habitat.* Borneo.—*Charus Iswaroides* (Pap. Iswaroides, Fruhstorfer, Berl. Ent. Zeit. 1897, p. 304. *Habitat.* Battak Mountains, Sumatra.

#### Genus SADENGIA.

*Papilio* (group 7), Rothschild, Nov. Zool. ii. p. 290 (1895).

IMAGO.—Closely allied to *Charus*. *Forewing* triangular; costa arched towards the end, exterior margin slightly scalloped; outer area of the upperside not clothed with fine short hairs above the scales, as is the case in *C. Helenus* and its allied forms. *Hindwing* comparatively broader and shorter; tail shorter.

TYPE.—S. Nephelus.

#### SADENGIA CHAON (Plate 457, fig. 1, 1a, b, c, ♂, 1d, ♀).

*Papilio Chaon*, Westwood, Arcana Ent. ii. p. 97, pl. 72, fig. 1, 1a, ♂ (1845). Doubleday and Hewitson, Gen. D. Lep. i. p. 11 (1846). Gray, Catal. Lep. B. M. i. p. 18 (1852); Moore, Catal. Lep. Mus. E. I. Compny, i. p. 102 (1857). Felder, Verh. Z. B. Ges. Wien. 1864, pp. 320, 367. Moore, P. Z. S. 1865, p. 757. Druce, P. Z. S. 1874, p. 109. Elwes, Trans. Ent. Soc. Lond. 1888, p. 429. Manders, *id.* 1890, p. 536. Oberthür, Etud. Ent. xvii. p. 4 (1893). Rothschild, Nov. Zool. ii. p. 291 (1895).

*Papilio (Charus) Chaon*, Elwes and de Nicéville, Journ. As. Soc. Bengal, 1886, p. 436. de Nicéville, Sikkim Gazetteer, 1894, p. 172.

*Charus Chaon*, Swinhoe, Trans. Ent. Soc. Lond. 1893, p. 312.

IMAGO.—Male. Upperside fuliginous-black. *Forewing* with slender longitudinal golden-yellow scaled streaks within the cell, and broad streaks between the outer

veins uniformly extending from the base ; a short white cilia lunular point between the veins, the apical one being sometimes elongated. *Hindwing* with a large creamy-white upper-discal patch usually composed of four portions, of which the upper portion is much the shortest, and, generally, the lower portion has an attached very small more or less whitish speckled spot ; in some specimens there are golden-yellow scales scattered longitudinally between the outer interspaces of the median branches, and, in others, the outer marginal and lower discal area are sparsely speckled with similar scales. Cilia alternated slenderly with white. Underside paler. *Forewing* with grey-scaled cell streaks and golden-yellow scaled outer vein streaks, these latter streaks either uniformly occupying the outer interspaces, or, in some, are more or less restricted to the apical area, with their inner ends slightly more defined and greyish-scaled—thus slightly indicating the presence of a subapical oblique fascia ; a bluish-white constricted spot is always present obliquely placed in the submedian interspace near the posterior angle, below which is a more or less white-speckled smaller spot ; cilia white points prominent. *Hindwing* with the upper and lower basal area and the cell streaks, or the whole dark area of the wing except the tail sparsely irrorated with golden-yellow or greyish scales ; upper discal patch white, of which the four portions, as above, are sometimes smaller, these being followed by three very much smaller lower-discal spots, which latter are either quadrate, bluntly conical, or lunular in shape, placed in the median and submedian interspaces, and thus form a transverse discal interrupted band, these three last spots are either white, or the third, and in some the second and third are yellowish-ochreous, and occasionally, but very rarely, these three lower-discal small spots are absent ; beyond is a submarginal row of six yellowish-ochreous lunules and an anal lunule ; cilia lunules prominently white. *Head* and thorax black ; collar and head white spotted ; abdomen fuliginous-black with a white lateral continuous streak and a sublateral row of dots ; legs black, femora white beneath ; antennæ black.

Female. Upperside paler, dark sepia-brown ; cell and vein-streaks paler, the anterior streaks having their base slightly greyish-white scaled outside end of the cell, and thus form an ill-defined subapical oblique fascia ; the posterior streaks are also more or less slightly greyish-white scaled ; marginal cilia white points and elongated apical cilia as in the male. *Hindwing* with the dark outer area in some specimens very sparsely irrorated with golden-yellow scales ; upper-discal patch similar to the male, composed of five portions, very pale yellow, the upper portion being shorter ; cilia slenderly alternated with white. Underside. *Forewing* similar to the male, except that, on the *forewing*, the subapical greyish-white fascia is more defined than on the upperside, the white spots at the posterior angle and the marginal points are larger ; and, on the *hindwing*, the anal and submarginal yellowish-ochreous lunules are broader, the marginal cilia lunules are also somewhat

broader and tinged with yellowish-ochreous. *Abdomen* with lateral white streaks and white spots beneath.

Expanse, ♂  $3\frac{1}{2}$  to  $4\frac{3}{4}$ , ♀ 5 to  $5\frac{1}{2}$  inches.

HABITAT.—Nepal; Sikkim; Assam; Cachar; Khasias; Burma; Shan States; Siam; Tonkin.

DISTRIBUTION.—We possess a male from Nepal, taken by the late Gen. G. Ramsay. Mr. H. J. Elwes says it is “not uncommon in the low valleys of Sikkim, and is often seen flying up and down the course of the rivers, in company with *Helonus* and many other species, from April on till October” (Tr. Ent. Soc. 1888, 429). Col. C. Swinhoe records it “common in the Khasia Hills” (Tr. Ent. Soc. 1893, 312). Mr. J. Wood-Mason obtained three males at Irangmara, Cachar, from July 25th to August 6th” (J. A. S. Bengal, 1886, 375). Col. C. H. E. Adamson says it is “widely spread throughout Burma, except in the hot plains” (List, 1897, 47). Capt. E. Y. Watson found it in the “Chin Hills, occurring rarely, in company with *Helonus*, during the dry season, January to June” (J. Bombay N. H. S. 1897, 671). Mr. Elwes records “two males from Ponsekai, Tavoy” (J. A. S. Beng. 1886, 436). Dr. N. Manders found it “not so common, in the Shan States, as *Helonus*, but occurring in the same localities” (Tr. Ent. Soc. 1890, 536).

Of our illustrations on Plate 457, fig. 1 and 1a are from Pegu males, 1b, Burma male, 1c, Nepal male, and 1d, female from Sikkim.

**SADENGIA PREXASPES** (Plate 458, fig. 1, 1a, ♂, 1b, c, ♀).

*Papilio Prexaspes*, Felder, Verh. Z. B. Ges. Wien. 1864, p. 320; *id.* Reise Novara Lep. i. p. 107, pl. 15, fig. D (1865). Butler, Trans. Linn. Soc. Lond. Zool. i. p. 553 (1877). Oberthür, Etud. Ent. iv. p. 46 (1879). Wood-Mason and de Niceville, Journ. As. Soc. Bengal, 1881, p. 254, ♀. Distant, Rhop. Malay. p. 345, pl. 29, fig. 2, ♂ (1885).

*Papilio fuscus Prexaspes*, Rothschild, Nov. Zool. ii. p. 297 (1895).

IMAGO.—Male. Upperside fuliginous-black; cilia alternated with white. *Forewing* irrorated from the base with golden-yellow scales forming longitudinal cell and outer vein streaks; and with a posterior small broken-cluster of whitish scales before the angle. *Hindwing* with an upper-discal large creamy-white or pale yellow patch divided by the black veins, composed of four portions, and a lower contiguous very small cluster of similar coloured scales in the upper median interspace, the third portion sometimes extending to within apex of the cell; lower-discal area traversed by more or less very sparsely irrorated with lunularly-disposed golden-yellow scales, those above the anal angle being pale blue. Underside paler. *Forewing* with the irrorated cell-streaks slender, the vein-streaks being restricted medially across the outer area, decreasing in length and more or less obsolescent, or obsolete hindward, where there

is a broken grey-scaled spot before the angle. *Hindwing* with the basal area, including the cell, irrorated with golden-yellow scales; upper-discal patch whiter than above, the lower or fourth portion followed by three bluish-white lunular spots, of which the inner one is broadest, thus forming a transverse discal band, each portion of which is outwardly-bordered by a contiguous blue-scaled lunule; beyond is a submarginal row of ochreous lunules, the lower three of which are sometimes almost obliterated, a similar coloured lunule is also present above the anal angle. *Body* fuliginous; front of thorax and head black, spotted with bluish-white; abdomen with a lateral continuous white streak; legs and antennæ black; femora white beneath.

Female. Upperside paler. *Forewing* with the outer area more densely irrorated with golden-yellow scales between the veins than in the male, thus forming more-defined streaks, their inner ends from near the costa across the disc being somewhat paler and slightly greyish anteriorly, and posteriorly ending in a golden-yellow scaled spot before the angle, thus indicating an obscurely-defined transverse discal fascia. *Hindwing* similar to the male. Underside. *Forewing* paler; cell streaks slender; with a distinctly defined outwardly-recurved transverse-discal greyish-white fascia, which commences broadly beyond the cell near the costa and there radiating outward with pale golden-yellow scales between the veins, decreasing in width and nearly obliterated posteriorly, where it joins the greyish-white scaled spot before the angle. *Hindwing* similar to the male. *Abdomen* black at the sides and beneath, with a lateral and sublateral continuous white streak interspaced with a row of white dots, and a broader white longitudinal streak beneath.

Expanse, ♂  $3\frac{3}{4}$  to  $4\frac{1}{2}$ , ♀ 4 to  $4\frac{1}{2}$  inches.

HABITAT.—S. Andamans; Cocos Island; Malay Peninsula; Borneo.

DISTRIBUTION.—Mr. J. Wood-Mason records "seven males and two females, from Port Blair, S. Andamans, taken by Mr. F. de Roepstorff" (J. As. Soc. Bengal, 1881, 254). Col. C. H. E. Adamson has a single male from Cocos Island.

Our illustration on Plate 458, figs. 1, 1a, b, c, are from Andaman male and female.

#### SADENGIA PITMANI (Plate 459, fig. 1, 1a, ♂).

*Papilio (Laertias) Pitmani*, Elwes and de Nicéville, Journ. As. Soc. Bengal, 1886, p. 434, pl. 20, fig. 1, ♂.

*Papilio Pitmani*, Rothschild, Nov. Zool. i. p. 685 (1894); *id.* II. p. 343 (1895).

Male. Upperside fuliginous-black; cilia alternated with white. *Forewing* irrorated with golden scales, those within the cell forming longitudinal streaks; two small clusters of these scales being more distinct near the posterior angle. *Hindwing*

with a transverse medial-discal creamy-white macular band composed of either six, or seven, portions, the upper one shortest, the three next longest, of which the fourth is narrowest, the fifth, sixth, and seventh decreasingly smaller, the sixth and seventh being slightly tinged with ochreous and sprinkled with brown scales; in some specimens the seventh spot is indicated only by a few ochreous scales, and in others, a small deep ochreous spot is present above the anal angle; lower outer-discal area with a few scattered golden-yellow scales. Underside duller fuliginous-black. *Forewing* with the golden irrorations restricted to the cell-streaks, and outwardly, either to the apical area, or transversely decreasing hindward; two posterior greyish-white scaled quadrate spots before the angle, and in some specimens two or three smaller similar spots in the interspaces above. *Hindwing* with the basal area irrorated with golden-yellow scales; the discal macular band, as above, pure white throughout; followed by a submarginal series of seven lunules, which are partly ochreous and white, beyond which are white cilia lunules on the margin. *Body* fuliginous-black; front of thorax and head black, spotted with white; abdomen with a lateral white streak; antennæ and legs black; fore femora white beneath.

Expanse, ♂  $3\frac{1}{2}$  to  $3\frac{3}{4}$  inches.

HABITAT.—Tenasserim.

DISTRIBUTION.—“Four males are recorded from Ponsekai, Tavoy” (de Nicéville, *l.c.* 434).

Our illustrations on Plate 459, fig. 1, 1a are from two males, taken at Ponsekai, Tavoy.

#### SADENGIA NOBLEI (Plate 459, fig. 2, 2a, ♂).

*Papilio Noblei*, de Nicéville, Journ. As. Soc. Bengal, 1888, p. 287, pl. 13, fig. 2, ♂; *id.* Journ. Bombay Nat. Hist. Soc. 1899, p. 335. Fruhstorfer, Deuts. Ent. Zeit. Iris, 1901, p. 268, ♀; *ib.* Ber. Ent. Zeit. 1902, p. 172, ♂ ♀. Rothschild, Nov. Zool. ii. p. 284 (1895).

*Papilio Henricus*, Oberthür, Etudes Ent. xvi. p. 3, pl. 4, fig. 39, ♂.

Male. Upperside fuliginous-black. *Forewing* with four slightly-apparent longitudinal cell-streaks composed of scattered ochreous scales; outer area not hairy-scaled; cilia black. *Hindwing* with a large upper-discal cream-coloured tripartite patch extending from the costal vein to the radial, of which the middle portion has its lower inner-end extending slightly within the cell; a dark red semicircle enclosing a black spot at the anal angle; cilia alternated with white. Underside. *Forewing* paler fuliginous-black; cell-streaks grey; outer veins speckled with grey scales at their extreme ends, and also at the ends of their intervening folds; a very few grey scales scattered over the discal area. *Hindwing* pale fuliginous-black basally, black exteriorly; upper discal patch as above; beyond which is a submarginal series of yellowish-ochreous lunules extending from the costa to upper median, a similar

lunule in the lower median interspace, an almost complete ring-spot at the anal angle, and above the latter an elongated pale greyish streak; a few blue scales are scattered on the lower-discal area between the submedian and radial.

Expanse, ♂, 4 inches.

HABITAT.—Burma; Tonkin.

DISTRIBUTION.—“Two males were taken in the Karen Hills, Lower Burma, in February and March” (de Nicéville, *l.c.* 287). Our description is from a male in Mr. Grose-Smith’s collection, taken by Mr. T. A. Hauxwell at Tounghoo, Upper Tenasserim, in March. Mr. de Nicéville records it from the “Katha District, Upper Burma” (J. Bombay N. H. S. 1899, 335). Both sexes were taken by Mr. H. Fruhstorfer in Middle Tonkin, who says “it is very shy, the males settle on moist sandy sheltered river banks, where they suck eagerly, but are terrified at the faintest rustle and dart suddenly upwards, to vanish among the highest branches of the trees, from whence they will not again emerge for half, or frequently a whole hour. The females never consort with the males upon the sand, but seek some secluded *Lantana* bush, where they opportunely encounter the males” (*l.c.* p. 268).

INDO-MALAY SPECIES.—*Sadengia Nephelus* (Pap. *Nephelus*, Boisduval, Spec. Gén. Lep. i. p. 210, 1836). Rothschild, Nov. Zool. ii. p. 290 (1895). *Habitat.* Celebes; Java.—*Sadengia Saturnus* (Pap. *Saturnus*, Guérin, Rev. Zool. 1840, p. 43. Staudinger, Exot. Schmett. i. p. 7, pl. 4, ♂ (1884). Distant, Rhop. Malay. p. 345, pl. 30, fig. 3, ♂, 4, 5, ♀ (1885). Pap. *Nephelus Saturnus*, Rothschild, *l.c.* p. 290 (1895). Pap. *Neptunus*, Guérin, Deless. Voy. pl. 18 (1843). Pap. *albolineatus*, Forbes, Nat. Wand. E. Arch. p. 275 (1885); Waterhouse, Aid. ii. pl. 166, fig. 1 (1886). *Habitat.* Malacca; Sumatra; Borneo.—*Sadengia Uranus* (Pap. *Uranus*, Weymer, Stett. Ent. Zeit. 1885, p. 271, ♂ ♀. Pap. *Nephelus Uranus*, Rothschild, *l.c.* p. 291 (1895). *Habitat.* Nias.—*Sadengia Nubilus* (Pap. *Nubilus*, Staudinger, Iris, 1895, p. 344. Rothschild, *l.c.* p. 291 (1895). *Habitat.* N. Borneo.—*Sadengia Diopantus* (Pap. *Diopantus*, Grose-Smith, Ent. Mo. Mag. 1883, p. 234, ♀; Rhop. Exot. Pap. p. 1, pl. 1, fig. 3, 4, ♂ (1887). Hagen, Iris, 1894, p. 22. Rothschild, *l.c.* p. 292 (1895). de Nicéville, Journ. As. Soc. Bengal, 1895, p. 515. *Habitat.* Sumatra.—*Sadengia Chaonulus* (Pap. *Chaon*, *subsp.* *Chaonulus*, Fruhst. Soc. Ent. 1902, p. 73. *Habitat.* Hainan.—*Sadengia Hipponous* (Pap. *Hipponous*, Felder, Wien. Ent. Monats. 1862, p. 283 ♂ ♀; *id.* Nov. Reise Lep. i. p. 104, pl. 15, fig. B, ♀. Rothschild, *l.c.* p. 342). *Habitat.* Philippines.

#### Genus ARAMINTA.

*Araminta*, Moore, Journ. Linn. Soc. Zool. 1886, p. 50; Kirby, Allen’s Nat. Hist. Lep. ii. p. 292 (1896).

*Papilio* (part), Doubleday and Hewitson.

*Papilio* (Demolion group), Wallace, Trans. Linn. Soc. xxv. p. 59 (1865).

*Papilio* (sect. 59), Felder, Verh. Z. B. Ges. Wien. 1864, pp. 318, 366.

*Papilio* (group 6, part), Rothschild, Nov. Zool. ii. p. 282 (1895).

IMAGO.—*Forewing* elongately-triangular; costa arched, exterior margin very oblique and almost even; cell long, very broad; the basal and outer dark area of the male clothed with very fine short hairs, so densely, as to conceal the scales beneath, those of the outer area being arranged somewhat in longitudinal patches. *Hindwing* short, broad, triangular; exterior margin scalloped and furnished with a lengthened spatular tail; cell more than half length of the wing. Antennæ with a lengthened slender club. Sexes similar.

LARVA.—Similar to that of *O. Erithonius*; anterior segments scutellated; furnished with two tentacular processes on the second, and two short fleshy processes on the ninth, and anal segment.

PUPA.—Curved abruptly backwards; head bifid; thorax with a lengthened curved acute thoracic process.

**ARAMINTA DEMOLION** (Plate 460, fig. 1, larva and pupa, 1a, b, ♂, 1c, ♀).

*Papilio Demolion*, Cramer, Pap. Exot. i. p. 140, pl. 89, fig. A, B (1776). Goeze, Ent. Beytr. iii. 1, p. 79 (1779). Jablonsky and Herbst, Nat. Schmett. iii. p. 199, pl. 49, fig. 1, 2 (1788). Doubleday and Hewitson, Gen. D. Lep. i. p. 13 (1846). Gray, Catal. Lep. B. M. I. p. 25 (1852). Moore, Catal. Lep. Mus. E. I. C. i. p. 105, pl. 3, fig. 5, 5a, larva and pupa (1857). Felder, Verh. Z. B. Ges. Wien. 1864, pp. 138, 366. Wallace, Trans. Linn. Soc. Lond. xxv. p. 59 (1865). Butler, Catal. Lep. Fabr. B. M. p. 253 (1869). Druce, P. Z. S. Lond. 1874, p. 108. Staudinger, Exot. Schmett. i. p. 7 (1884). Kheil, Rhop. Nias, p. 37 (1884). Distant, Rhop. Malay. p. 349, pl. 27B, fig. 3, ♂ (1885). Pryer, Ann. and Mag. Nat. Hist. 1887, p. 273. Staudinger, Iris, i. p. 277 (1888). Hagen, Berl. Ent. Zeit. 1892, p. 154; *id.* Iris, vii. p. 26 (1894). Rothschild, Nov. Zool. ii. p. 282 (1895).

*Araminta Demolion*, Moore, Journ. Linn. Soc. Lond. Zool. 1886, p. 50.

*Papilio (Araminta) Demolion*, de Nicéville, Journ. As. Soc. Bengal, 1895, p. 513.

*Papilio Cresphontes*, Fabricius (*nez* Cramer), Spec. Ins. ii. p. 19 (1781). Horsfield, Catal. Lep. Mus. E. I. Company, pl. 3, fig. 4, 4a, larva and pupa (1828). Lucas, Lep. Exot. p. 23, pl. 15, fig. 1 (1835). Boisduval, Spec. Gén. Lep. i. p. 220 (1836). Chenu, Ency. d'Hist. Nat. Pap. pl. 1, fig. 1 (1851).

*Heraclides Cresphontes*, Hübnér, Verz. bek. Schmett. p. 84 (1816).

IMAGO.—Male and female. Upperside fuliginous-black. *Forewing* with the basal area very sparsely irrorated with yellow scales; with an oblique transverse discal macular band, composed of a linear series of nine pale sulphur-yellow spots, extending from the posterior margin and decreasing in size to the apex; the anterior six are rounded and separated by the veins, the lower three being more quadrate in

shape and conjoined; cilia black. *Hindwing* with a transverse subbasal broader pale sulphur-yellow continuous band, extending from the costa to abdominal margin, its inner edge being almost even, the outer edge extending across the cell at some distance from its apex, and above which the edge is outwardly twice acutely angled; beyond is a submarginal series of six pale sulphur-yellow lunules, of which the two upper are much the smallest and either conical or rounded in shape; at the anal angle is a parti-coloured reddish-ochreous half-circlet enclosing a black spot, the ochreous tint being brightest in the female; above the latter is a small cluster of bluish-grey scales; cilia slenderly alternated with white. *Underside*. *Forewing* greyish-black, lower basal area clothed with pale yellowish-grey scales and fine short hairs; cell-streaks prominent, pale grey; transverse discal macular band, as on upperside, much paler yellow; outer veins edged with grey scales at their tips and with an intervening short grey marginal streak between the veins; the veins to near their ends pale yellow. *Hindwing* with the basal area greyish-black and densely covered with pale yellowish-grey scales; the transverse band, as on upperside, much paler yellow; apex of cell, and outer-discal area deep black between the veins; crossed by a medial-discal curved row of six bluish-grey lunules, and a submarginal bordering series of broad pale yellow lunules, of which latter the anterior and the anal ringlet and also the discal edges of the veins are tinged with bright ochreous. *Body* above fuliginous-black, beneath pale yellow; collar, head, and front yellow spotted; legs black, femora beneath pale yellow; antennæ black.

Expause, ♂ ♀  $3\frac{3}{4}$  to  $4\frac{1}{2}$  inches.

*LARVA*.—Similar to that of *O. Erithonius*. Anterior segments scutellated; furnished with two tentacular processes on the second segment, and two short fleshy processes on the ninth and anal segment.

*PUPA*.—Curved abruptly backwards; head bifid; thorax with a lengthened curved acute thoracic process.

*HABITAT*.—Lower Burma; Tenasserim; Siam; Malay Peninsula; Sumatra; Nias; Java; Borneo; Palawan.

*DISTRIBUTION*.—"Not uncommon about Tavoy in the autumn months. One specimen caught in Tounggya Sekkam, Upper Tenasserim, in February" (Col. C. H. E. Adamson, List, 1897, 48). We possess a female from Tavoy, taken in January by Mr. Tucker. Mr. T. A. Hauxwell obtained it in the Salween Valley, Upper Tenasserim, in November. A specimen from Moulmein is in the British Museum. Dr. J. Anderson took it in "Mergui, in December" (J. Linn. Soc. Zool. 1886, 50). Mr. H. Druce records it from "Chentaboon, Siam" (P. Z. S. 1874, 108). Dr. L. Martin writes, "In N.E. Sumatra it flies from March to July in the forests of the outer Hills, from Selesseh to South Bekantschan. Is rather rare in our area. The males have a quick and restless flight and frequent flowers, on which they do



not settle, but abstract the honey while hovering. The larva feeds on *Citrus*" (J. As. Soc. Bengal, 1895, 513).

Of our illustrations on Plate 460, fig. 1 is from Dr. Horsfield's Java drawings of the larva and pupa; fig. 1a, b is a male from the Salween Valley, and fig. 1c a female from Tavoy.

**ARAMINTA LIOMEDON** (Plate 461, fig. 1, larva and pupa, 1a, b, ♂, 1c, ♀).

- Papilio Liomedon*, Moore, Proc. Zool. Soc. Lond. 1874, p. 575. Hampson, Journ. As. Soc. Bengal, 1888, p. 364. Davidson and Aitken, Journ. Bombay Nat. Hist. Soc. 1890, p. 367, pl. D, figs. 1, 2, 3, larva and pupa. Ferguson, Journ. As. Soc. Bengal, 1891, p. 446.  
*Papilio Demolion Liomedon*, Rothschild, Nov. Zool. ii. p. 283 (1895).

IMAGO.—Male and female. Upperside similar to *A. Demolion*, but differs, on the forewing, in all the spots, composing the transverse discal pale sulphur-yellow band, being distinctly separated from one another, and are somewhat smaller in the female. On the hindwing the pale sulphur-yellow band is placed farther from the base, with its outer edge extending beyond the cell; the submarginal lunules are somewhat larger and have more acute outer points. Underside similar to *Demolion*, but with the same differences in the band, on both wings, as on the upperside, and on the hindwing the discal black patches between the veins are shorter.

Expause, ♂ 4, ♀ 3½ inches.

LARVA and PUPA.—(See Plate 461.)

HABITAT.—South India.

LIFE HISTORY.—“On the 2nd of August we were on the very peak of Goodhally Hill, when one of us noticed a *P. Liomedon* flying suspiciously round a tree in very thick jungle. This was a tempting butterfly, but with a painful effort of self-control the net was laid down and the butterfly patiently tracked until, after wearisome vacillation, it settled on a tender shoot of *Acronychia laurifolia*. It remained settled for a long time, and then flew off altogether, leaving ten eggs, laid one on top of the other, as shown on the plate. On the 7th of August the caterpillars emerged, and, to minimize risk, were divided between three glass tubes, tightly corked. On August 10th a gust of wind blew one of the tubes off the table and three of the caterpillars perished, but the remaining seven thrived and were in due time transferred to a branch standing in a bottle of water. The mouth of the bottle was plugged with cotton wool, but two of them forced their way in and committed suicide. By a prompt use of the means recommended by the Humane Society for the restoration of persons apparently drowned, one was revived, but continued weakly, and was soon

after killed by ants. Five passed successfully through all dangers and became beautiful specimens, one female and four males. All through their lives these larvæ continued gregarious, dispersing occasionally to feed, but always returning to rest side by side on the upper surface of a leaf. The following dates may be interesting. Eggs laid, 2nd August; hatched, 7th August; skins cast (and eaten), 12th August; again, 17th; and again, 20th to 22nd August. The most advanced cast its skin again on the 28th of August, became a pupa on the 2nd of September, and emerged on the 15th of September. The others followed within two days. At first the larvæ were of an oily-yellow colour, and bore many pairs of spiny points, but these disappeared with age, and after the last moult there were only the short fleshy processes on the second and last segment which characterize the group, and one additional curved pair on the ninth segment. The colour after the last moult was a clear slaty-blue, changing eventually to a greenish tint, with light brown markings very much the same as those which characterize the rest of the *Erithonius* group. The pupa was more abruptly bent back from the middle of the thorax than that of *Pap. Erithonius*, and adorned on the thorax with a sword-shaped horn, fully three-eighths of an inch long, and always bent a little either to the right or left. The colour, of the pupa, was brown, or green and yellow, according to situation" (J. Davidson and E. H. Aitken, Journ. Bombay N. H. Soc. 1890, 367).

DISTRIBUTION.—"This is not a rare butterfly in Kanara, but more local than most species, owing perhaps to the larva feeding exclusively (so far as we know) on *Acronychia laurifolia*, a tree which is almost confined to the tops of wooded hills. We have met with the butterfly chiefly from August to October" (J. Davidson and E. H. Aitken, J. Bombay N. H. S. 1896, 581). The late Mr. S. N. Ward writes, "I found this butterfly only about Calicut, and reared the larva" (MS. Notes). The food-plants of the larva are *Evodia Roxburghiana* and *Acronychia laurifolia*, both of the Order Rutaceæ" (J. R. D. Bell, J. As. Soc. Beng. 1900, 258). Mr. G. F. Hampson records "two specimens obtained in September on the Western Slopes of the Nilgiris, at 2500 feet elevation" (J. As. Soc. Beng. 1888, 364). Mr. H. S. Ferguson records "six specimens taken in Travancore. Seen oftener in the low country than on the Hills, and of those taken, all but one were more or less damaged" (J. Bombay N. H. S. 1891, 446).

Of our illustrations on Plate 461, fig. 1 represents the larva and pupa copied from Mr. Ward's original drawings; fig. 1a, b from a Karwar male, and fig. 1c from a female reared at Calicut by Mr. Ward.

PHILIPPINE SPECIES.—*Araminta Antonio* (*Papilio Antonio*, Hewitson, Exot. Butt. v. *Pap.* pl. 14, fig. 46, ♂ (1875). Haase, Untersuch. üb. Mim. p. 39 (1893). Rothschild, Nov. Zool. ii. p. 284 (1895). *Pap.* (*Araminta*) *Antonio*, Semper, Phil. Tagfalt. p. 274, pl. 47, fig. 4, ♂ (1892). *Habitat.* Mindanao.

## Genus LAERTIAS.

*Laertias*, Hübner, Verz. bek. Schmett. p. 84 (1816). Moore, Lep. of Ceylon, i. p. 150 (1881).

*Papilio* (sect. 60, subsect. a), Felder, Verh. Z. B. Ges. Wien. 1864, pp. 318, 366.

*Papilio* (group H), Wallace, Trans. Linn. Soc. Zool. xxv. p. 51 (1865).

*Papilio* (group 18), Rothschild, Nov. Zool. ii. p. 341 (1895).

IMAGO.—Wings short, broad. *Forewing* triangular; costa arched, apex rounded. *Hindwing* convex and scalloped externally, with a more or less developed spatular tail, in both sexes, from the upper median veinlet. Cell in both wings broad. *Body* short; antennal club moderately stout. Sexes, in the normal form, similar. Female polymorphic; *second and third form mimics* of other Papilioninæ.

LARVA.—Smooth, glossy; attenuated posteriorly; anterior segments swollen and scutellated; twelfth segment with a pair of small pointed tubercles; front of second segment projecting, truncated, and, when irritated, it thence exerts a blood-red retractile branched tentacle emitting an offensive odour.

PUPA.—Curved anteriorly backward; head flattened and bifid in front; thorax conically pointed in front and tuberculate laterally; wing cases laterally dilated and slightly tuberculate; abdominal segments with slight dorsal tubercles.

TYPE.—L. Pammon.

## LAERTIAS PAMMON (Plate 462, 463, 464).

*Papilio Pammon*,\* Linnæus, Syst. Nat. ed. x. p. 460, ♂ (1758); Mus. Lud. Ulr. p. 746, ♂ (1764); Syst. Nat. ed. xii. p. 745, ♂ (1767). Clerck, Icones Ins. i. pl. 14, fig. 2, ♂ (1764). Fabricius, Syst. Ent. p. 445, ♂ (1775). Esper, Ausl. Schmett. p. 25, pl. 4, fig. 2, ♀ (1785). Boisduval, Spec. Gén. Lep. i. p. 272, ♂ ♀ (1836). Doubleday and Hewitson, Gen. D. Lep. i. p. 11 (1846). Hutton, Trans. Ent. Soc. Lond. v. p. 49 (1847). Lang, Ent. Mo. Mag. 1864, p. 101. Moore, Proc. Zool. Soc. Lond. 1865, pp. 487, 756, *id.* 1878, pp. 696, 840. Wallace, Trans. Linn. Soc. xxv. 1865, p. 51, pl. 2, fig. 1 ♂, 3 ♀. de Nicéville Journ. As. Soc. Bengal, 1885, p. 52.

*Princeps Heroicus Pammon*, Hübner, Samml. Exot. Schmett. i. pl. 109, fig. 1, 2 (1806-16).

*Laertias Pammon*, Hübner, Verz. bek. Schmett. p. 84 ♂ (1816). Moore, Proc. Zool. Soc. 1882, p. 259. Swinhoe, Proc. Zool. Soc. 1885, p. 145; *id.* 1886, p. 433.

*Papilio Polytes*, Linnæus, Syst. Nat. ed. x. p. 460 (1758), ♀ *2nd form*; Mus. Lud. Ulr. p. 186, ♀ (1764); Syst. Nat. ed. xii. p. 746, ♀ (1767). Clerck, Icones Ins. i. pl. 14, fig. 1, ♀ (1764). Fabricius, Syst. Entom. p. 443 (1775). Sulzer, Gesch. Ins. p. 141, pl. 12, fig. 3, ♀ (1776). Cramer, Pap. Exot. iii. p. 129, pl. 265, fig. C, ♀ (1782). Jablonsky, Nat. Schmett. ii. p. 185, pl. 15, fig. 2, ♀; *id.* pl. 20, fig. 3, 4, ♀ (1775). Esper, Ausl. Schmett. p. 50, pl. 12, fig. 1, ♀ (1786). Hutton, Trans. Ent. Soc. v. p. 49, ♀ (1847). Moore, Proc. Zool. Soc. 1865, pp. 487, 756, ♀. Lang, Ent. Mo. Mag. 1864, p. 101, ♀. Wallace, Tr. Linn. Soc. Zool. 1865, p. 51, pl. 2, fig. 5, ♀. Butler, Catal. Fabr. Lep. B. M. p. 253, ♂ ♀ (1869). Druce, Proc. Zool. Soc.

\* We use *Pammon* as the proper name for this butterfly in preference to that of *Polytes*—both names appearing on the same page in Syst. Nat. *Pammon* applies to *both sexes* of the *normal form* of the species, and *Polytes* to that of one of the subsequently-developed *mimetic forms* of the female.

- 1874, p. 108, ♂ ♀. Butler, Tr. Linn. Soc. Zool. 1877, p. 552, ♂ ♀. Aurivillius, Kongl. Sv. Vet. Acad. Handl. 1882, p. 11, ♀, p. 13, ♂. Staudinger, Exot. Schmett. i. p. 7, ♂ ♀ (1884). Distant, Rhop. Malay. p. 347, pl. 33, fig. 7, ♂, 8, 9, ♀, 1st form, fig. 10, 2nd form, ♀ (1885). Elwes, Tr. Ent. Soc. 1888, p. 429, ♂ ♀. Davidson and Aitken, Journ. Bombay N. H. Soc. 1890, p. 366, larva and pupa. Rothschild, Nov. Zool. ii. p. 343, ♂ ♀ (1895). Fruhstorfer, Berl. Ent. Zeit. 1902, p. 174.
- Menelaudes Polytes*, Hübner, Verz. bek. Schmett. p. 85 (1816) ♀.
- Papilio (Laertias) Polytes*, Swinhoe, P. Z. S. 1884, p. 512, ♂ ♀. Doherty, Journ. As. Soc. Bengal, 1886, p. 137, ♂ ♀. Hampson, *id.* 1888, p. 363, ♂ ♀.
- Laertias Polytes*, Moore, Journ. As. Soc. Bengal, 1886, p. 51, ♂ ♀. Swinhoe, Tr. Ent. Soc. 1893, 313 ♂ ♀.
- Papilio Romulus*, Cramer, Pap. Exot. i. p. 67, pl. 43, fig. A (1776), ♀, 3rd form. Jablonsky, Nat. Schmett. ii. p. 145 (1784). Esper, Ausl. Schmett. p. 105, pl. 25, fig. 2, ♀ (1785-98). Fabricius, Spec. Ins. ii. p. 2, ♀ (1781). Doubleday and Hewitson, Gen. D. Lep. i. p. 10 (1846). Wallace, Tr. Linn. Soc. Zool. 1865, p. 52, pl. 2, fig. 6. Chaumette, Ent. Mo. Mag. 1865, p. 37.
- Menelaudes Romulus*, Hübner, Verz. bek. Schmett. p. 84 (1816).
- Laertias Romulus*, Moore, Lep. of Ceylon, i. p. 150, pl. 59, fig. 1, 1a, ♂ ♀, b, c, 2nd and 3rd form, ♀ (1881).
- Papilio Mutius*, Fabricius, Ent. Syst. iii. 1, p. 3, ♀ (1793). Godart, Enc. Méth. ix. p. 70 (1819).
- Papilio Cyrus*, Fabricius, Ent. Syst. iii. 1, p. 7, ♀ 1st form (1793).
- Laertias Cyrus*, Hübner, Verz. bek. Schmett. p. 84 (1816), Samml. Exot. Schmett. ii. pl. 96, fig. 1, 2, ♀ 1st form (1820-26).
- Papilio Astyanax*, Fabricius, Ent. Syst. iii. 1, p. 13, ♀ 3rd form (1793). Donovan, Ins. of India, pl. 19, fig. 1 (1800).
- Papilio Stichius*, Hübner, Samml. Exot. Schmett. i. pl. 112, ♀ 2nd form (1806-16).
- Papilio Pammon*, var. *Nikobarus*, Felder, Verh. Z. B. Ges. Wien. 1862, p. 463; *id.* 1864, p. 319, ♂ ♀ 1st form. Moore, P. Z. S. 1877, p. 592. Wood-Mason, Journ. As. Soc. Bengal, 1880, p. 237. de Nicéville, *id.* 1881, p. 253, *id.* 1882, p. 18.
- Papilio Polytes*, var. *Ceylanicus*, Felder, Verh. Z. B. Ges. Wien. 1864, pp. 319, 367, ♂ ♀.
- Normal Form.** (Plate 462, fig. 1, larva and pupa, fig. 1a, ♂, 1b, ♀).
- Papilio Pammon*, Linn. Syst. Nat. ed. x. p. 460, ♂ (1758); *id.* ed. xii. p. 746, ♂ (1767). Mus. Lud. Ulr. p. 189, ♂ (1764). Clerck, Icones Ins. i. pl. 14, fig. 2, ♂ (1764). Fabr. Syst. Ent. p. 445, ♂ (1775). Esper, Ausl. Schmett. p. 25, pl. 4, fig. 2 (1785). Boisduval, Spec. Gén. Lep. i. p. 272, ♂ ♀ (1836). Hutton, Tr. Ent. Soc. Lond. 1847, p. 49. Lang, Ent. Mo. Mag. 1864, p. 101. Moore, P.Z.S. 1865, pp. 487, 756; *id.* 1878, pp. 696, 840. Wallace, Tr. Linn. Soc. xxv. 1865, p. 51, pl. 2, fig. 1 ♂, 3 ♀.
- Princeps Heroicus Pammon*, Hübner, Samml. Exot. Schmett. i. pl. 109, fig. 1, 2 (1806-16.)
- Laertias Pammon*, Hübn. Verz. bek. Schmett. p. 84 (1816). Moore, P. Z. S. 1882, p. 259, ♂ ♀. Swinhoe, *id.* 1885, p. 145, larva and pupa; *id.* 1886, p. 433, ♂ ♀.
- Papilio Cyrus*, Fabricius, Ent. Syst. iii. 1, p. 7 (1793).
- Laertias Cyrus*, Hübner, Verz. bek. Schmett. p. 84 (1816); Samml. Exot. Schmett. ii. pl. 96, fig. 1, 2 (1820-26).
- Papilio Nicobarus*, Felder, Verz. Z. B. Ges. Wien. 1864, pp. 318, 367. Moore, P. Z. S. 1877, p. 592. Wood-Mason, Journ. As. Soc. Bengal, 1880, p. 237. de Nicéville, *id.* 1881, p. 253; *id.* 1882, p. 18.

*Papilio Polytes*, var. *Ceylanicus*, Felder, Verh. Z. B. Ges. Wien. 1864, pp. 319, 367, ♂ ♀.

*Laertias Romulus*, Moore, Lep. Ceylon, i. p. 150, pl. 59, fig. 1, 1a, ♂ ♀, (1881).

*Papilio Polytes*, Distant, Rhop. Malay. p. 347, pl. 33, fig. 7, 8, 9, ♂ ♀ (1885),  *nec* fig. 10. Aurivillius, Kongl. Sv. Vet. Akad. Handl. 1882, p. 13, ♂.

IMAGO.—Male and female similar. Male. Upperside fuliginous-black. *Forewing* with very slightly-defined golden-yellow scaled slender longitudinal cell streaks and similar wider outer-vein streaks; an outer marginal series of small creamy-white spots, including the cilia, placed between the veins, and decreasing in size upward to the apex. *Hindwing* with a transverse discal recurved series of seven variable short cream-white spots, divided by the veins, the lowest spot generally having a few outer-bordering blue scales, and occasionally an incipient small subanal red lunule; cilia alternated with white. Underside paler. *Forewing* with the cell and outer vein scaled-streaks as above, the latter restricted to the apical area; marginal spots as above. *Hindwing* with the basal area very sparsely irrorated with greyish-white scales; the transverse discal series of white spots as above, these latter sometimes with a few scattered outer bordering blue-grey scales, or, the two lower spots only with a lunular cluster of these scales; followed by a submarginal series of small more or less ochreous lunulate spots, and a brighter ochreous lunule above the anal angle; and then a marginal series of white ciliary lunules. Body, legs, and antennæ black; front of thorax and head white spotted; abdomen with a lateral slender longitudinal white streak, and dots beneath; fore femora whitish beneath.

Female. Similar to male. Upperside paler. *Forewing* with similar scaled streaks and marginal spots, the latter being creamy-yellow. *Hindwing* with the transverse discal cream-white band generally composed of somewhat longer spots, the lowest outwardly bordered by scattered blue scales and a distinct red subanal lunule, which latter is sometimes ocellate; beyond, generally, is a submarginal series of narrow reddish more or less defined lunules. Underside paler. *Forewing* similar to the male. *Hindwing* with the discal band as on the upperside, the subanal and the submarginal lunules all prominent and red, the marginal white ciliary lunules also present.

Expanse, ♂  $3\frac{1}{2}$  to  $4\frac{1}{4}$ , ♀  $3\frac{1}{4}$  to  $4\frac{1}{2}$  inches.

Second form of ♀ (Plate 463, fig. 1, 1a, b, c, d, e, ♀).

*Papilio Polytes*, Linn. Syst. Nat. ed. x. p. 460, ♀ (1758);  *id.* ed. xii. p. 746, ♀ (1767). Mus. Lud. Ulr. p. 186 (1764). Clerck, Icones Ins. i. pl. 14, fig. 1, ♀ (1764). Fabricius, Syst. Ent. p. 443 (1775). Sulzer, Gesch. Ins. p. 141, pl. 12, fig. 3, ♀ (1776). Cramer, Pap. Exot. iii. p. 129, pl. 265, fig. C, ♀ (1782). Jablonsky, Nat. Schmett. ii. p. 185, pl. 15, fig. 2, ♀;  *id.* pl. 20, fig. 3, 4 ♀ (1784). Esper, Ausl. Schmett. p. 50, pl. 12, fig. 1, ♀ (1786). Wallace, Tr. Linn. Soc. xxv. p. 51, pl. 2, fig. 3, ♀, 1865. Aurivillius, Kongl. Sv. Vet. Akad. Handl. 1882, p. 11. Distant, Rhop. Malay. p. 347, pl. 33, fig. 10 (1885).

*Menelaides Polytes*, Hübner, Verz. bek. Schmett. p. 84 (1816).

*Papilio Stichius*, Hübner, Samml. Exot. Schmett. i. pl. 112 (1806-16).

*Laertias Romulus*, Moore, Lep. Ceyl. i. p. 150, pl. 59, fig. 1, b (1881).

IMAGO.—Mimic of *M. Aristolochiæ*. Upperside fuliginous-black. *Forewing* with pale fuliginous slender cell streaks and broad outer vein-bordering streaks, the former being palest anteriorly, the latter extending from the cell and terminating uniformly at some distance from the outer margin; cilia slenderly alternated with white. *Hindwing* with the outer-discal dark area more or less slightly irrorated with blue scales; a medial-discal white patch, composed, generally, of four elongated portions extending somewhat transversely from beyond the cell, or, in a curved series varying in size from its end, and with an additional smaller fifth portion placed within apex of the cell; in some specimens there are only two central white portions, in others sometimes three discal portions, the outer one of the latter then being generally much the smallest; rarely, a fifth whitish inner portion is present in the submedian interspace, generally the latter interspace and sometimes also the lower part only of the adjoining portion in the lower median interspace is dark-red irrorated with blue scales; in those specimens where the two central white portions only are present, the adjoining outer portion of the patch and both ends of the central portions are red, the lower median and submedian red portion being then continued hindwards to the corresponding submarginal lunule; beyond is a row of red submarginal lunules, which are either narrow and angular or broadly lunular, followed by a marginal row of slender red cilia lunules between the veins, the cilia itself being white. Underside paler than the upperside. *Forewing* with the cell-end streaks and the outer vein bordering streaks also much paler, and either fuliginous-grey or ochreous-grey. *Hindwing* with the markings as on upperside; the basal area also irrorated with grey scales; the submarginal lunules being somewhat broader, lighter red, and more or less irrorated with pale blue scales.

Expanse,  $3\frac{1}{2}$  to  $4\frac{3}{4}$  inches.

Third form of ♀ (Plate 464, fig. 1, 1a, b, c, d, ♀).

*Papilio Romulus*, Cramer, Pap. Exot. i. p. 67, pl. 43, fig. A, ♀ (1776). Jablonsky, Nat. Schmett. ii. p. 145 (1784). Esper, Ausl. Schmett. p. 105, pl. 25, fig. 2, ♀ (1785). Fabricius, Spec. Ins. ii. p. 2, ♀ (1781). Wallace, Tr. Linn. Soc. xxv. p. 52, pl. 2, fig. 6, 1865.

*Papilio Astyanax*, Fabricius, Ent. Syst. iii. 1, p. 13 (1793). Donovan, Ins. of India, pl. 19, fig. 1 (1800).

*Papilio Mutius*, Fabricius, Ent. Syst. iii. 1, p. 3 (1793).

*Laertias Romulus*, Moore, Lep. Ceylon, i. p. 150, pl. 59, fig. 1, c. (1881).

IMAGO.—Mimic of *M. Hector*.—Upperside. Fuliginous-black, or black. *Forewing* with the portions of the cell-streaks obliquely before its end, the outer vein-streaks

basally from the third median veinlet to the posterior angle, and the base of the anterior streaks to the second subcostal being greyish-white or pale ochreous-white, thus forming similar placed oblique-fasciæ to those in forewing of *M. Hector*. *Hindwing* with a dark purplish-red small, or large, apical cell spot, five, or rarely four, small oval or elongated contiguous discal spots, and a submarginal series of broad lunular spots, and then a marginal series of narrow ochreous-red ciliary lunules; the upper two, or three, of the submarginal and marginal series sometimes being ochreous-white; these markings and the dark outer discal area also being more or less irrorated with blue scales; in some specimens these markings are light-red and the marginal lunules almost white, and, occasionally, the discal series are much elongated and then partly coalesce with the submarginal lunules. Underside paler. *Forewing* with the white cell and vein streaks as on upperside. *Hindwing* with markings as on the upperside.

Expanse,  $3\frac{1}{2}$  to  $4\frac{1}{2}$  inches.

HABITAT.—India; Ceylon; Burma; Tenasserim; Mergui Archipelago; Nicobar and Andaman Isles; Malay Peninsula; Siam; Tonkin; Sumatra.

LIFE HISTORY.—LARVA.—“March 3rd. After 3rd change,  $\frac{3}{4}$  inch long. Ground colour, olive green, closely mottled and punctured with pale yellowish green. Dorsal line faint, dark green and interrupted, inflated into a triangular patch, bordered by pale yellowish, or cream on each incision. From the 6th to the 9th segments on the back, a very distinct and broad V-like patch of clear cream colour or milky, the point of which commencing precisely on the centre of the 9th segment, and extending the two branches—one on either side—as far as the stigmata on the 6th segment. On the 12th and 11th segments a similar coloured broad patch in the shape of a well defined U, the base of which is at base of 12th segment, the arms extending on either side of larva. A broad short dash of same colour directed from either side of 2nd segment as far as the 4th, and at this end of it is a small threefold spot of small triangular patches of black. A small cylindrical or rather oblong spot of the same black at the extremity or near the extremity of each branch of the V and U. On each side of dorsal line a row of longitudinal short round elevated tubercles of dark green and shining, also a transverse crest of same on 4th segment, a similar crest on 3rd segment. *Prolegs* and *anal legs* milk white, with a broad lateral line of same colour immediately over them. *Thoracic legs* pale carmine. *Head* small and glossy, pale green, reddish towards the mandibles, and surmounted on either side of its incision on the 2nd segment with two little bright yellow rough projecting tentacles. At the base of the U-shaped spot a small cream-coloured sharp tubercle on each side. On anal segment a cream-coloured triangular mark. *Abdomen* pale sea-green. *Stigmata* small, black, bordered by pale brown.

After last change, length  $1\frac{1}{4}$  inch. General characters, smooth and glossy, very

much attenuated posteriorly, the anterior segments being swollen and slightly gibbous on back. *Ground colour*, rich glossy green. *Dorsal line* indistinct, a trifle darker. The entire back of larva is of a uniform 'ground colour' with the exception of the V-like patch which originates on back of 9th segment and dilates towards the feet to the 8th segment; colour, cream mottled with bistre. The V is not united on back. A small irregular patch on either side of dorsal line on the 10th segment, and a larger one on same segment precisely over the legs, of the same colour as V-shaped patch. Between 6th and 5th segment is a singular crest of cream colour prettily edged, tapering to a yellow line on side of incision which leads in a curve to the edge of 2nd segment, and is entirely carried round and joined to the other side in a similar way, so that a great portion of the sides of the anterior segments appear of the same colour as the abdomen; on 4th segment a curved crest of cream colour, not reaching to the sides, prettily marked, and terminating at each side in a black two-fold spot, sides milk-white, speckled here and there with dark colour, especially the anal segment. Base of 12th segment terminating on either side by a small pointed tubercle of cream-colour, joined together by a line of same colour. Front of 2nd segment projecting and strongly truncate. *Abdomen* and *prolegs* pale green. *Head* and thoracic legs and sides of anterior segments pinkish green, slightly pilose. *Stigmata* pale, surrounded by light brown. When irritated it exhibits a fine velvet black collar immediately behind the crest of the 6th segment by contracting the anterior segments and swelling the parts. It also exhibits when irritated, behind the head, a curious Y-shaped retractile tentacle of a 'blood red colour,' accompanied by an offensive smell. *Feeds* on the Shaddock (*Citrus decumana*). It is slow in its movements. Holds to the leaves by means of a thin web under the legs.

**PUPA.**—Went into chrysalis on March 11th, 1861. Succinctæ; triangular at its posterior portion, the anal segment being the one point, considerably flattened and swollen on the sides; the anterior segments having the 1st terminating in two ear-shaped appendages directed forwards, and an elevated tubercle on the under-surface of 2nd segment, and a smaller one on either side. On the 6th, 7th, and 8th segments on the under-surface a small tubercle, on either side of ventral line. From the 6th to 12th segment the under-surface is milk white. On 4th and 5th segments is an oblong square dark brown patch on ventral line. The chrysalis is olive brown, greatly variegated with brown, green, and yellow spots and fascia; the sides (on upper surface) are handsomely marked by three scollops of pale yellowish-green, the smallest toward the head.

**IMAGO.**—A female (*Polytes*) came out on March 25th, 1861. Lucknow." (Capt. H. L. de Chaumette, May 9th, 1861).

**DISTRIBUTION, HABITS, ETC.**—In the N.-W. Himalayas, *Pammon* is recorded as



captured in Kashmir, in 1872, by Capt. R. Bayne Reed (MS. Notes). Capt. A. M. Lang records both "*Pammon* and *Polytes* as rare, occurring at low elevations" (P. Z. S. 1865, 487). He also writes, "I have seen caught at Kasauli a *Papilio* like *Polytes*, but with the forewings slashed with white between the median and discoidal veinlets (*Romulus*); at Umballa I have lately taken two egg-laden females—one of *Pammon*, one of *Polytes*. The former is abundant here, not so the latter" (*Epist.* Aug. 24th, 1864). Major J. W. Yerbury took "*Pammon* at Hurripur in October" (Ann. N. H. 1888, 206). Major H. B. Hellard obtained it at "Abbottabad and Rawul Pindi, Simla, and Masuri" (MS. Notes). Major H. C. Harford reared the larva at Kasauli, in October, 1889, and from his original drawings our figures on Plate 462 are copied. Mr. P. W. Mackinnon found it "very common in the low valleys near Masuri from April to October, and in the Dehra Dun almost throughout the year. The females are of three forms—the 3rd form, which mimics *Hector*, although that butterfly does not occur in the same area. We have a single specimen, taken in the Dun in July, which is exactly intermediate between forms 2 and 3, as it has the yellowish-white markings on the upperside of the forewings as in form 3, and a small patch of white in and beyond the cell of the hindwing on the upperside, as in form 2. In the Dehra Dun one of the food plants of the larva is *Murraya Kœnigii*, N. O. Rutaceæ (J. Bombay N. H. S. 1898, 593). Mr. W. Doherty obtained it in "Kumaon generally, from 1000 to 6000 feet elevation; common" (J. As. Soc. Beng. 1856, 137). The Rev. J. H. Hocking found the "larva on the Lemon tree, in the Kangra Hills, in June. The perfect insect, male and female of *Pammon* form, fly from March to December at an elevation of 6000 feet. The *Polytes* form is more restricted to the hot valleys, not appearing before June, and very rarely found above 4000 feet" (P. Z. S. 1882, 259). Capt. H. L. Chaumette found it at "Lucknow; it frequents shady copses and is fond of the flowers of the Orange tribe. Flight heavy. The larva found in March feeding on the Shaddock (*Citrus decumana*) and reared. The imago is rather common, and is on the wing almost the whole year" (MS. Notes).

Proceeding southwards, we have Col. C. Swinhoe's record of "one pair of *Pammon*, said to have been taken in Karachi. The female of *Diphilus* pattern not observed in Karachi by me" (P. Z. S. 1884, 512). "I saw quantities of *Polytes* on my march from Bombay to Saugor, C. India, but not one of *Pammon*" (Capt. Chaumette, Ent. Mo. Mag. 1865, 37). Dr. A. Leith, in his Bombay MS. Notes, writes, "I observed *P. Pammon* on July 26th, 1859, depositing eggs on the opening buds of *Triphasia trifoliata*. The twigs were gathered and the caterpillars appeared on July 29th, and were reared, the pupæ being formed August 19th, the butterflies, several of *Pammon* and one of *Polytes*, emerging on September 1st." Col. C. Swinhoe found it "common in Mhow, C. India, from Sept. to March. The

females taken were all of the *Diphilus* form" (P. Z. S. 1886, 433). "It is common everywhere in Bombay and the Dekkan throughout the year; the females of *Hector* and *Diphilus* form. The larvæ and pupæ are very similar to those of *P. Erithonius*. The larvæ feed on Citron, Lime, and Orange. Larval stage fourteen days, pupal stage fourteen days. The pupa is either bright green or brown; both kinds are equally common, and each produces both sexes" (*id.* P. Z. S. 1885, 145). "In the N. Kanara district this butterfly is on the wing at all seasons, but most numerous about September and October. Females of the same colour as the male are scarce in this district. The larva is very common and very destructive to Orange and Lime trees in gardens. In the forest we have found it most commonly on *Glycosmis pentaphylla* and *Zanthoxylum Rhetsia*" (J. Davidson and E. H. Aitken, J. Bombay N. H. S. 1896, 580). Mr. S. N. Ward obtained *Pammon* "in Malabar and Kanara, above and below the Ghats, and *Romulus* in Mangalore, Sirey, Calicut, and on the Shevaroy Hills" (MS. Notes). Mr. G. F. Hampson records it from the "Nilgiris at 1000 to 7000 feet elevation. The three forms of female taken" (J. As. Soc. Bengal, 1888, 363). "Two specimens of *Pammon* taken at Kathlekau, Mysore, in December and January" (Capt. E. Y. Watson, *l.c.* 1890, p. 9). "All three forms of female taken in Madras, from March to August, *id. l.c.* 1880, 268). In Travancore "it is common in the low country and up to 2000 feet on the Hills. The three forms of female occur" (H. S. Ferguson, J. Bombay N. H. S. 1891, 16).

In Ceylon it occurs "everywhere; more abundantly in the low country; the *Polytes* form of female scarcer than *Romulus*, but found in the same range" (F. M. Mackwood, MS. Notes). Dr. Thwaites remarks, "I have repeatedly reared the three forms of female larvæ apparently quite undistinguishable from one another" (Lep. Ceyl. i. 150).

Mr. E. Ernest Green, writing from Punduloya, Ceylon, January 25th, 1885, says, "I have caught several impregnated females of this butterfly, but I find that they are unwilling to deposit their eggs in captivity, and have hitherto died without doing so; but from one female—the form (*Romulus*) with the forewing having two transverse interrupted bars of white, and hindwing spotted with dull red, with no white markings—I expressed a single egg, after the death of the fly on September 24th, 1884. This egg hatched out on September 30th, and was reared upon Orange leaves, until it changed into the pupa some time in October, and from this pupa the imago—a male *Pammon*—which I send you, emerged on January 23rd, 1885. I have seen all the different varieties of the female on the wing here in the same months."

Ascending the continent eastward, it is recorded that "the three forms of this butterfly are common at Khorda, in Orissa" (W. C. Taylor, List, 1888, 17). "In Calcutta it is the commonest *Papilio*; all three forms of the female occur, the form

which mimics *Hector* being the rarest. Larva reared on *Glycosmis pentaphylla*, *Ægla marmelos*, and the Common Lime" (de Nicéville, J. As. Soc. Beng. 1885, 52). "It is common in Barrackpur Park, Calcutta, from March to October; the female forms *Polytes* and *Romulus* much less frequently met with" (J. Rothney, Ent. Mo. Mag. 1882, 33). Col. C. Swinhoe records it from the Khasia Hills (Tr. Ent. Soc. 1893, 313). Mr. J. Wood-Mason obtained "thirty-eight males, and three females of the first form like the male, fourteen of the *Polytes* form, and one of the *Romulus* form, taken in the forests in and around Silchar, Cachar, from April 3rd to August 12th" (J. A. S. B-ng. 1886, 376). It is "a common species in Sikkim throughout the year, except in the three coldest months, at low elevations; the third form (*Romulus*) is extremely rare in Sikkim, as *Hector*—the butterfly it mimics—does not occur there; the second form (*Polytes*) is the commonest of the three" (de Nicéville, Sikk. Gaz. 1894, 172). Mr. H. J. Elwes also records it as being "found in Sikkim at low elevations only, from March all through the year" (Tr. Ent. Soc. 1888, 429). Mr. G. C. Dudgeon obtained it in Bhotan.

In Burma, Capt. E. Y. Watson obtained it during the Chin-Lushai Expedition of 1889-90, at Pauk, Pokoko, and Tilin, in September, October, November, December, and May" (J. Bombay N. H. S. 1891, 53). Col. C. H. E. Adamson records "males and two forms of female excessively common throughout Burma; one specimen only of the form *Romulus* was taken by me near Akyab in November" (List, 1897, 47). Signor L. Fea obtained the first form at Malawoon in August, and the second form at Bhamo in October and November. Dr. N. Manders says it is "very common almost everywhere in the Shan States" (Tr. Ent. Soc. 1890, 535). Mr. O. Limborg obtained it at Ahsown, 200 feet elevation, at Meetan, 3000 feet, in March, and at Taoo from 3000 to 5000 feet, in March" (P. Z. S. 1878, 840). "A single male was taken in the hills of the Siamese frontier" (H. J. Elwes, J. A. S. Bengal, 1887, 434). Dr. J. Anderson obtained it in "Mergui, December and March; Elphinstone Island, March; Thapo and Thaing Island in January and February, and on Sullivan Island in January" (J. Linn. Soc. Zool. 1886, 51).

From the Nicobar Islands, Mr. J. Wood-Mason records "males and females of the 1st form, from Nankowri and Kar Nicobar; males from Pulo Kondul and Great Nicobar, and one female of the 2nd form, from Nankowri or Kamorta" (Journ. As. Soc. Bengal, 1882, 18). Mr. R. Meldola also obtained specimens of the 1st form at "Nankowri and Kamorta, and also at Port Blair, S. Andamans" (P. Z. S. 1877, 592). Mr. F. de Roepstorff took "males and females of the 1st form at Port Blair, S. Andamans" (J. As. Soc. Beng. 1880, 237). We possess both sexes of the 1st form (*Pammon*) from the Nicobars, these being identical with Burmese and Indian specimens. We also have both sexes of the 1st form from the Andamans, which do not differ except in the macular band on hindwing being somewhat broader.

It also occurs in the Malay Peninsula; Sumatra; Siam; and Tonkin.

Of our illustrations on Plate 462, fig. 1 represents the larvæ in its various stages, copied from Major Harford's original drawings; fig. 1a is a male from Manpuri, W. India, fig. 1b, a normal (*Pammon*) from Masuri. On Plate 463, the 2nd form of female (*Polytes*) fig. 1, 1b, from Ceylon, 1a, from Nepal, 1c, from Calcutta, 1d, from Calicut, S. India. On Plate 464, the 3rd form of female (*Romulus*) figs. 1, 1a, from Ceylon, 1b, from Calicut, 1c, from Bombay, and 1d, from Calcutta.

**LAERTIAS SAKONTALA** (Plate 465, fig. 1, 1a, ♂).

*Papilio Sakontala*, Hewitson, Trans. Ent. Soc. Lond. 1852, p. 24, pl. 5, fig. 1, ♂. Doherty, Proc. Zool. Soc. Lond. 1891, p. 250. Rothschild, Nov. Zool. ii. p. 343 (1895). de Nicéville, Journ. Bombay, N. H. Soc. 1898, p. 593.

IMAGO.—Male. Upperside black; cilia slenderly alternated with white. *Forewing* with slightly-defined slender longitudinal pale ochreous scaled cell-streaks and similar scaled outer vein-streaks. *Hindwing* with a short tail; a transverse curved medial-discal grey-scaled macular band, composed of seven spots, the three upper quadrate or outwardly dentate, the lower four narrower, more elongate, and posteriorly decreasing to above anal angle, and in the type specimen there is also a small anal slender grey lunule; the outer marginal dark area being very sparsely speckled with blue scales.

Underside. *Forewing* paler; fuliginous-black, the cell and outer vein scaled-streaks grey, the latter most defined. *Hindwing* black; the transverse discal macular band as above, the upper spot with a contiguous outer reddish lunule, the next spot with a grey and blue-scaled lunule, the sixth or penultimate lower spot with an outer cluster of red and blue scales, and the lowest with an outer slender red lunule, followed by a sub-marginal small red lunule in the lower median interspace; the cilia inwardly edged with a slender white-scaled lunule, the subanal one being broader. *Body*, legs, and antennæ black; front of thorax and head white spotted.

Female. Unknown.

Expanse, ♂  $3\frac{1}{2}$  to 4 inches.

HABITAT.—Silhet; Naga Hills; Sikkim; Masuri; Dehra Dun.

DISTRIBUTION.—The type specimen is stated by Mr. Hewitson to be from Silhet. Mr. W. Doherty, *l.c.*, records it from the "Naga Hills." A male, from "Sikkim," from Mr. Otto Möller's collection, is in Mr. Walter Rothschild's possession. Mr. L. de Nicéville records "a single male, from Masuri, in the Indian Museum, Calcutta, and another male from Dehra Dun, in his own possession, which has the usual discal series of white spots on the upperside of the hindwing almost entirely obliterated,

they being represented only by an irrorated clump of whitish scales in each interspace, where the macular band should be. I have little doubt that this so-called distinct species is only an atavistic form of *P. Polytes*, Linn." (J. Bombay N. H. S. 1898, 593).

**LAERTIAS WALKERI** (Plate 465, fig. 2, ♂).

*Papilio Walkeri*, Janson, Cistula Entom. ii. p. 433, pl. 8, fig. 2, ♂ (1879). Rothschild, Nov. Zool. ii. p. 338 (1895).

IMAGO.—Male. "Upperside black-brown; cilia alternated with white. *Forewing* with four faint lines in the cell at the base, and two rather indistinct longitudinal stripes on the outer disc, between each of the nervures, of rather sparse pale ochreous scales. *Hindwing* with a broad ill-defined transverse band about the middle, deeply emarginate, between the nervures on its outer edge, pale slate-blue; a sub-marginal series of seven irregular spots and the usual lunule on the abdominal margin, cinereous; tail short and broad, not contracted at the base. Underside. *Forewing* not so dark as above, the markings similar, but rather more pronounced. *Hindwing* with four ochreous spots in a transverse row about the middle on the abdominal half, broadly margined with pale blue on their outer side, these spots are also slightly indicated on the costal half of the wing, the submarginal spots and abdominal lunule similar to those above, but larger and of a pale ochreous colour. *Body* and head black-brown; several small spots on the latter, on the breast, and the outer side of the legs, white."

Expanse, ♂  $4\frac{1}{2}$  inches.

HABITAT.—S. India.

The type specimen, now in the possession of Mr. Walter Rothschild, is the only known example of this species.

Our illustration, on Plate 465, is copied from Mr. Janson's published figure.

INDO-MALAY SPECIES.—*Laertias borealis* (Pap. *Polytes*, *var. borealis*, Felder, Wien. Ent. Monats. vi. p. 22, ♂ ♀ (1861). Butler, P. Z. S. 1877, p. 814. Leech, Tr. Ent. Soc. 1889, p. 65. Rothschild, Nov. Zool. ii. p. 348 (1895). *Syn.* Pap. Pammon, Cramer, Pap. Exot. ii. pl. 141, fig. B, ♂ (1779). Jablonsky, Nat. Schmett. ii. pl. 19, fig. 4, ♂. Stoll, Cramer, *l.c.* v. pl. 33, fig. 1, 1a (♀ 1st form). Wallace and Moore, P. Z. S. 1866, p. 356. Oberthür, Et. Ent. xi. p. 14 (1886). Pap. Pammon, *var. Thibetanus*, Oberthür, Et. Ent. xiii. p. 14 (1886). Pap. *Polytes*, Leech, Butt. of China, ii. p. 552, ♂ ♀ (1893). Pap. *Polytes borealis* Mandame, Rothschild, *l.c.* ii. p. 348, ♀ (1895). *Habitat.* China; Kiu-Shiu; Loo Choo; Formosa; Hainan.—*Laertias Theseus* (Pap. *Theseus*, Cramer, *l.c.* ii. p. 128, pl. 180, fig. B, ♀ (1779). Jablonsky, *l.c.* ii. p. 162, pl. 14, fig. 3, ♀ (1784). Wallace, Tr. Linn. Soc. xxv. p. 52,

pl. 2, figs. 2, 4, 7, ♂ ♀ (1865). *Syn.* Pap. Pammon *et* Polytes, Horsfield, Catal. Lep. E. I. C. pl. 3, figs. 1, 1a, 2, 2a, *larva* and *pupa* (1828). Piepers, Tijds. v. Ent. 1876, pp. 156, 352, pl. 8, figs. 6, 7, 8, *larva* and *pupa*. Pap. Numa, Weber, Obs. Ent. p. 106, ♂ (1801). Pap. Ledebourus, Zink.-Som. Nov. Acta Acad. N. C. 1831, p. 148, ♂. Pap. Antiphus, De Haan, Verh. Nat. Gesch. Ned. 1840, p. 40, pl. 8, fig. 2, ♀. Pap. Polytes, *var.* Javanus, Felder, Verh. Z. B. Ges. Wien. 1862, p. 486, ♀. Pap. Melanides, De Haan, *l.c.* p. 40, pl. 8, fig. 3, ♀ (1840). *Papilio* (*Laertias*) *Polytes*, de Nicéville, Journ. As. Soc. Bengal, 1895, p. 517. Pap. Polytes Theseus (part), Rothschild, Nov. Zool. ii. p. 349 (1895). *Habitat.* Sumatra; Nias; Natuna; Borneo; Java.—*Laertias Ledebouria* (Pap. Ledebouria, Eschsch. Kotz. Reise iii. p. 206, pl. 3, fig. 7, ♂ (1821). Felder, Reise Nov. Lep. i. p. 99 (1865). *Syn.* Pap. Elyros, Gray, List Lep. B. M. i. p. 26 (1856). Pap. Alphenor, Semper, Philip. Tagf. p. 276 (1892). Pap. Horsfieldii, Reakirt, Proc. Ent. Soc. Philad. 1864, p. 470, ♂ ♀. Pap. Polytes Alphenor (part), Rothschild, *l.c.* 351 (1895). *Habitat.* Philippines; Palawan.

#### Genus ORPHEIDES.

*Orpheides*, Hübner, Verz. bek. Schmett. p. 86 (1816). Moore, Lep. of Ceylon, i. p. 146 (1881).

*Papilio* (part), Doubleday and Hewitson.

*Papilio* (sect. 33, subsect. B), Felder, Verh. Z. B. Ges. Wien. pp. 309, 356 (1864).

*Papilio* (group L), Wallace, Trans. Linn. Soc. Lond. xxv. p. 59 (1865).

*Papilio* (group 5 part), Rothschild, Nov. Zool. ii. p. 272 (1895).

IMAGO.—*Forewing* triangular; costa arched, apex somewhat obtusely pointed, exterior margin slightly concave; cell long, extending fully two-thirds the length of wing, broad; first subcostal branch emitted at two-fifths and second branch at one-fifth before end of the cell; upper discocellular outwardly oblique, lower shortest. *Hindwing* broadly ovate; exterior margin convex, scalloped; cell long. Male with the abdominal margin grooved along the submedian, hairy. Thorax clothed with fine long hairs at the sides; antennæ slender, club short and thick. Sexes similar.

LARVA.—Adult. Cylindrical, attenuated posteriorly; anterior segments scutellated, third to fifth swollen; furnished with two small short tubercles on anal segment and two on second segment; a nuchal Y-shaped fleshy tentacle protruded when irritated.

PUPA.—Convex beneath; head broad in front and slightly bifid; thorax dorsally conical and projected in front.

TYPE.—O. Demoleus.

**ORPHEIDES DEMOLEUS** (Plate 406, fig. 1, *larvæ* and *pupa*, 1a, b, ♂, 1c, ♀).

*Papilio Demoleus*, Linnæus, Syst. Nat. ed. x. p. 464 (1758);=(Ehret, Plant. ac Pap. pl. 5 (1748);

Kuorr, Del. Nat. pl. C, 5, fig. 1 (1751);=Clerck, Icones Ins. iii. pl. 6, fig. 1 (1764). Houttuyn,

Nat. Hist. i. 2, p. 217 (1767). Esper, Ausl. Schmett. p. 201, pl. 50, figs. 1-4 (1797). Donovan, Ins. of China, pl. 28, fig. 1, ♀ (1798). Thon, Nat. Schmett. p. 18, pl. 6, fig. 19 (1837). Rothschild, Nov. Zool. ii. p. 279 (1895).

*Tachyptera Demoleus*, Berge, Schmett. p. 102, pl. 34, fig. 2, d, ♂ (1842).

*Papilio Erithonius*, Cramer, Pap. Exot. iii. p. 67, pl. 232, fig. A, B (1782). Jablonsky and Herbst, Nat. Schmett. iii. p. 109, pl. 36, fig. 5, 6 (1788). Doubleday and Hewitson, Gen. D. Lep. i. p. 12 (1846). Moore, Catal. Lep. Mus. E. I. Company, i. p. 105, pl. 3, fig. 6, 6a, *larva* and *pupa* (1857). Felder, Verh. Z. B. Ges. Wien. pp. 309, 356 (1864). Lang, Ent. Mo. Mag. 1864, p. 101. Wallace, Trans. Linn. Soc. Lond. xxv. p. 59 (1865). Chaumette, Ent. Mo. Mag. 1865, p. 37. Moore, Proc. Zool. Soc. Lond. 1865, pp. 487, 757; id. *l.c.* 1866, p. 356. Butler, Catal. Fabr. Lep. B. M. p. 245 (1869). Druce, P.Z.S. 1874, p. 108. Butler, *ib.* p. 814 (1877). Oberthür, Etud. Ent. iv. p. 57 (1879). Aurivillius, Kongl. Sv. Vet. Akad. Handl. 1882, p. 34. Forsayeth, Tr. Ent. Soc. Lond. 1884, p. 386. Elwes, *ib.* 1888, p. 429. Cotes, Indian Mus. Notes, Calcutta, i. p. 93, pl. 6, fig. 1 ♂, 1a, b, c, *larva* and *pupa* (1889). Davidson and Aitken, Journ. Bombay N. H. S. 1890, p. 366. Woodrow, *ib.* 1891, p. 114. Beetham, *ib.* 1891, p. 328. Leech, Butt. of China, ii. p. 554 (1893). Walker, Tr. Ent. Soc. 1895, p. 470.

*Princeps Dom. Erithonius*, Hübner, Exot. Schmett. i. pl. 117 (1806).

*Orpheides Erithonius*, Moore, Lep. of Ceylon, i. p. 147, pl. 61, fig. 2, ♀ 2a, b, *larva* and *pupa* (1881), id. P. Z. S., 1882, p. 258. Swinhee, *ib.* 1885, p. 145; id. *l.c.* 1886, p. 432. *ib.* Journ. Bombay N. H. S., 1887, p. 279. *ib.* Tr. Ent. Soc. Lond. 1893, p. 314.

*Papilio (Orpheides) Erithonius*, de Nicéville, Journ. As. Soc. Bengal, 1885, p. 51. Doherty, *ib.* 1886, p. 137. Wood-Mason, *ib.* 1886, p. 377. Elwes, *ib.* 1886, p. 438. Hampson, *ib.* 1888, p. 363. Ferguson, Journ. Bombay N. H. S. 1891, p. 446. de Nicéville, Sikkim Gazetteer, 1894, p. 173.

*Papilio Epius*, Fabricius, Ent. Syst. iii. 1, p. 35 (1793). Donovan, Ins. of China, pl. 28, fig. 2, ♂ (1798). Boisd. Spec. Géa. Lep. i. p. 238 (1836). Templeton, Tr. Ent. Soc. Lond. 1847, p. 44. Hutton, *ib.* *l.c.* p. 48 (1847). Vollenhov. Tijl. v. Ent. 1860, p. 77. Bisenert, Lep. Erg. Persien, p. 26 (1869). Oberthür, Etud. Ent. xvii. p. 6 (1893).

*Orpheides Epius*, Hübner, Verz. bek. Schmett. p. 86 (1816).

*Papilio Erithonius* var. *Demoleinus*, Oberthür, Etud. Ent. iv. p. 57 (1879).

IMAGO.—Male. Upperside black. *Forewing* with the basal area crossed by slender pale yellow strigæ, those within the cell being more or less broken and partly forming four longitudinal dotted-streaks, those below the cell being wavy and most slender; costal vein also lined with yellow scales; two outwardly-disposed pale yellow spots within apex of the cell, a narrow streak at its end, and one above the latter, followed by an inwardly-oblique transverse discal series of irregular-shaped and variable-sized pale yellow spots, the five lowest being the largest, the upper four being disposed in a cluster beyond end of the cell; sometimes there is also a slender incurved lunule present in the lower interspace of the radial; beyond is a submarginal regularly-disposed row of more uniform smaller-sized spots, the upper one being lengthened, somewhat lunate in shape and placed obliquely before the apex, and then a corresponding row of very small triangular cilia-spots on the extreme margin; the outer-discal dark area is more or less slightly irrorated with minute pale yellow scales. *Hindwing* with a transverse subbasal broad pale yellow

irregular-shaped band, which crosses the middle of the cell, its inner-edge curving from the costa to above anal angle, its outer-edge with an attached elongated triangular spot within base of the subcostal interspace, and a lower-discal series of, generally two, sometimes three, or more rarely four, smaller spots, which are disposed within the base of the median and radial interspaces, the third and fourth, when present, being minute; beyond is a submarginal row of six broad spots, the lower five of which are indented on their outer edge, and the sixth, or upper, is lunate; followed by a marginal row of broad cilia-lunules; the circular interspace between the latter and the upper portion of the subbasal band encloses an upper, more or less, or densely-speckled blue-scaled lunule—the centre of the space also sometimes being orange-yellow scaled—and thus forms a more or less defined ocellus; at the anal angle is a dark red oval spot, which is usually anteriorly bordered by a blue-scaled lunule; the basal and inter-discal black area is irrorated with minute yellow scales, and the base with interspersed fine long hairs. Underside brownish-black; yellowish markings paler. *Forewing* with prominent costal streak, continuous cell-streaks and two parallel streaks below base of the cell; the apical cell-spots, transverse discal, submarginal, and marginal spots as on the upperside, the latter being broader; anteriorly between the discal and submarginal spots, from the costa to the third median, is a series of ochreous more or less speckled lunules. *Hindwing* with the subbasal band and its contiguous outer spots, the submarginal and marginal spots as on upperside, the marginal series being broader; within apex of the cell is a rich ochreous-yellow lunule bordered with blue scales, and a row of similar ochreous-yellow broad lunules traversing the discal interspaces, these latter sometimes being greyish-ochreous; the anal spot being darker ochreous or red; base of wing pale yellow intersected by the black veins and edge of subbasal band. *Body* above black; thorax and abdomen above speckled with minute pale yellow scales; sides of thorax above clothed with fine longish hairs; front of head, collar, and tegulae with a pale yellow longitudinal stripe; palpi, streaks on thorax beneath, and abdomen beneath pale yellow, the latter with a sublateral ochreous black-edged longitudinal streak; legs black above, femora beneath pale yellow; antennae black, club above streaked with ochreous.

Female. Upperside paler brownish-black. *Forewing* similar to male, except that the cell-strigae are less broken and are more regularly transverse, and the outer-discal area more numerously irrorated with minute pale scales. *Hindwing* similar to male, except that the costal ocellus is more prominent, the anal dark red spot with a black anterior spot and a more prominent blue-scaled lunule. Underside similar to male.

Expanse, ♂  $2\frac{1}{2}$  to  $3\frac{3}{4}$ , ♀  $3\frac{1}{2}$  to 4 inches.

MELANIC VARIETIES.—A female, from Ceylon, in Mr. O. Janson's possession, has



the ground-colour of the upperside of both wings black; the *forewing* showing only four whitish oblique lower-discal spots and the two within apex of the cell, and the *hindwing* only the cell and the two lower contiguous spots; all the other markings being entirely black. Another female, from Assam, in our own possession, has the ground-colour of the upperside dark sepia-brown, and the markings ochreous-yellow; the costal ocellus of the hindwing and the anal spot being as in normal specimens; the underside has the markings duller yellow. A male, from Malabar, also in our possession, has the ground colour of the upperside dark ochreous-brown, with the markings sullied brownish-yellow, the underside being similarly coloured, but paler.

LARVA AND PUPA. (See Plate 466.)

HABITAT.—S.E. Arabia; Persia; North-Western, Eastern, and Continental India; Ceylon; Siam; S. China; Hong Kong; Hainan; Formosa.

LIFE HISTORY.—Mr. L. de Nicéville writes: "I have had considerable experience in breeding this species, the larva of which I have most frequently found on the Bael (*Ægle marmelos*), but it feeds also, in Calcutta, on the Orange, Pomelo, Lime, Ber (*Zizyphus jujuba*), and a low-growing weed, to be found in all waste places, called *Glycosmis pentaphylla*. The eggs of *Pap. Erithonius* are always, as far as I know, laid on the very young shoots and leaves on which the young larvæ exclusively feed. When they grow older, the caterpillars eat the old and full-grown leaves. The eggs are conspicuous objects, being pale yellow in colour and perfectly smooth. The young larvæ closely resemble the droppings of birds, and always rest fully exposed to view on the upper side of the leaves. They are probably protected not only by their superficial resemblance to something uneatable, but, in addition, are furnished with a strong odour, which may be very repugnant to the taste of birds. I rather doubt the tentacles, with which the larvæ are furnished, being scent-organs. I fancy they are entirely used to frighten away their enemies. The extreme rapidity with which they can be thrust forth, their large size and bright colour, would not unlikely drive off a female Ichneumon-fly in the act of depositing her eggs in the body of the caterpillar, and this fly is certainly the greatest enemy the butterfly has. When full-grown the larva dons quite a different livery, being green, with some oblique markings on the sides. At this stage it usually rests on the stems of the leaves, where it is well-hidden." (Indian Mus. Notes, Calcutta, i. p. 94 (1889).

Capt. H. L. Chaumette reared the larva of this butterfly in Lucknow, in 1860, and describes the various stages thus:—"After 1st moult. Length  $\frac{1}{4}$  inch. Ground-colour olive or olive-brown; dorsal line interrupted, dark olive; sides irregularly spotted and speckled with black, grey, and olive; abdomen pale olive; head and legs pale olive; stigmata black. On 6th, 7th, 8th, and 9th segments a peculiar milky patch of a V-shape, the two arms of which directed towards the head and reaching to the sides of the 6th segment. A small uneven patch of same colour on either side

of anal segments and a smaller one on either side of 2nd and 3rd segments. A row of tubercles on either side of dorsal line on every segment except the 8th, the largest on the 2nd and 13th, the smallest on the 6th. They are of an olive colour, and longish, with short bristly hairs on each. Besides these, on either side of tubercles of the 2nd, 3rd, and 4th segments there are two smaller extra ones, on either side of primary one. *After 2nd moult.* Differs little from the former except in size. *After 3rd moult.* Length  $\frac{3}{4}$  inch. Differs by the ground-colour being green or bright olive; dorsal line very indistinct, and replaced instead by a row of round black spots, one on each incision of middle segments; lateral line broad and milk-white, just over the legs; abdomen whitish, with a faint ventral line; legs all red brown; head ditto; stigmata light brown, bordered by black; on 9th segment on back, two reddish or velvet-black irregular small patches and one on either side of same segment of same colour, irregular, but larger; on 8th and 7th segment a V-shaped broad patch, directed as in first moult, but not united on back, of reddish or velvet-black colour. Sometimes one, two, or even three lateral rows of minute black spots, each placed on the incision. At the base of 3rd and 4th segment an elevated crest of orange colour prettily variegated, and reaching to the sides, that on the 3rd segment bordered anteriorly by velvet. On either side of 3rd segment a small black patch. Anal segment mottled and variegated with white, black, and grey, and at the incision furnished with two small orange pointed tubercles. Also 2nd segment slightly truncate, each side being terminated in a small tubercle of same colour. *After last moult.* Length fully  $1\frac{3}{4}$  inch. Body cylindrical and attenuated posteriorly; ground-colour varies, some being dark green without markings, others very pale green; otherwise as in 3rd moult. When irritated, the caterpillar extends from back of head a curious retractile tentacle of a Y-shape, with which it is furnished, of a saffron colour, and accompanied by a foetid odour. Feeds on Orange, Lime, Shaddock, etc., of which it eats the younger leaves. Habits very slow, and walks by jerks. Went into chrysalis August 11th. Chrysalis grey or green, mottled and variegated with white and lilac. Imago emerged August 21st. Habits: quick on the wing; flies dodgingly. Very fond of the flowers of the Orange tribe, and those of the *Raphanus sativus*. Found at Lucknow in abundance. On the wing the whole year" (MS. Notes).

DISTRIBUTION.—Two specimens of the male of this common butterfly from Muscat, S.-E. Arabia, are in the British Museum collection. It is recorded from Persia (Bienert, *l.c.* p. 26). Capt. R. Bayne Reed took it in Kashmir (MS. Notes). Mr. J. H. Leech took it at Rajaori in September, and Capt. Thompson in the Dugi Pass Reyling, 12,000 feet elevation. Major J. W. Yerbury obtained it at "Campbellpur, 1200 feet elevation, in April, June and July, being common in October and November" (P. Z. S. 1886, 377, *ib.* Ann. N. H. 1888, 205). Major H. B. Hellard

took it at "Allahabad and Rawal Pindi, and at Simla and Masuri" (MS. Notes). Mr. P. W. Mackinnon says it is "occasionally taken in Masuri. Occurs also in the Giri Valley in the Nahan territory in November, and is very common in the Dun from March to November" (Journ. Bombay N. H. S. 1898, 592). Capt. T. Hutton found it in "Deyra Dhun, and likewise in the Hills during the summer, the larva feeding on the Citron" (Tr. Ent. Soc. 1847, 48). Mr. W. Doherty records it from "Ranibagh and Bageswar, 1000 to 4000 feet elevation, in Kumaon" (J. As. Soc. Beng. 1886, 137). The Rev. J. H. Hocking took it at "Dharmasala, the larva found feeding on orange tree in May" (P. Z. S. 1882, 258). Capt. H. L. Chaumette found it "one of the commonest butterflies in Lucknow, being found daily in every garden, road, and field in numbers, the larvæ feeding on the Orange, Lime, Shaddock, &c." (MS. Notes). Major J. Le Mesurier took it in Scind, and Capt. Lloyd obtained it in Kattywar (MS. Notes). Col. C. Swinhoe records it as "common in Karachi all the year through" (P. Z. S. 1884, 512); also "common everywhere in Bombay and the Dekkan throughout the year. Larva feeds on Citron, Lime, and Orange; reared at Poona all the year round" (id. *l.c.* 1885, 145). Also "common at Mhow from Sept. to March" (id. *l.c.* 1886, 432). Mr. J. Davidson and E. H. Aitken say it is the "commonest Papilio in the Bombay Presidency. We have reared it abundantly in many places on different varieties of the Lime or Orange trees, and also on the Pomelo, but it forsakes all these for the unpleasantly odoriferous garden Rue (*Ruta augustifolia*). In the Konkan we once found it literally in flocks, feeding on a Leguminous plant with aromatic leaves. The colour of the larva, at first, is a very dark shade of green, almost black, with two broad, diagonal, cross-bands of yellowish-white. At this stage it has an oily gloss, and has been supposed by some to mimic the excrement of birds. At the last moult it assumes a fine green colour, with certain yellowish-white markings, which vary in extent, these are the ridges on the forepart of the 4th segment, a line or band behind the 5th, an elongated triangular patch on each side, with its base on the light colour of the under parts at the 8th segment, and its upper sloping into the 9th, a similar but smaller patch on the 10th, and nearly the whole of the last segment. The pupa is green when found among leaves, but brown of various shades if attached to a trunk or dead branch. The butterfly is very common, frequenting gardens more than the forest, and appears from October till at least January, and in less numbers after that till June" (J. Bombay N. H. S. 1890, 366; *id.* 1896, 580). Mr. L. de Nicéville records the food-plants of the larva in Kanara as follows:—" *Ruta augustifolia*, *Glycosmis pentaphylla*, *Murrayia Koenigii*, *Citrus decumana*, and *Egyle marmelos*" (J. As. Soc. Beng. 1900, 258). Mr. S. N. Ward obtained this butterfly in "Malabar, Kanara, Nilgiris, and the Karnatic. It appears late in February and all through March. The larva affects the Rue plant, Orange and Lime. It is very common on

the West Coast during the early part of the monsoon ; again late in the monsoon in August, September, and October. Its changes occupy 8 or 10 days. In its early stages the larva has spikes like those of the *Ornithoptera*, *P. Hector*, etc." (MS. Notes). Mr. G. F. Hampson obtained it on the "Nilgiris at 1000 to 7000 feet elevation" (J. As. Soc. Beng. 1888, 363). Lieut. E. Y. Watson took it in "Mysore, in October, November, December, and January ; very common" (J. Bombay N. H. S. 1890, 9). Mr. H. J. Ferguson found it "common in the low country and the Hills of Travancore" (id. *l.c.* 1891, 446). In Ceylon, it is "a common low-country butterfly and takes a large share in the annual migratory flights" (de Nicéville, J. As. Soc. Beng. 1899, 221. "Mr. F. M. Mackwood records it as being found in the low-country of Ceylon, and up to about 4000 feet elevation. Abundant at all times of the year. Capt. Wade took it at Colombo, very common, also at Galle. Appears at Kandy, but not very plentiful" (Lep. Ceylon, i. 147). Sir W. Elliot obtained it "commonly, in Madras, the larva being found feeding on *Feronia elephantum*, also on the Lime (*Citrus Limonium* and *C. decumana* ; on *Chloroxylon Ehretia* and *C. Swietenia* in July, on *Ruta angustifolia* in September, and *Psoralea corylifolia* in December and June, and on *Triphasia trifoliata*" (MS. Notes). Mr. W. C. Taylor records it as "very common at Khorda, in Orissa" (List, 1888, 16). Mr. J. Rothney says it is "very common in Barrackpur Park, near Calcutta, from March to end of October" (Ent. Mo. Mag. 1882, 33). Mr. L. de Nicéville records it as "very common in Calcutta. Larva feeds upon *Egyle marmelos*" (J. As. Soc. Beng. 1885, 51). Capt. Mortimer Slater writes "very common all over the Bengal Presidency. The larva feeds on the Lime, Orange, and Bel tree" (MS. Notes). Col. C. Swinhoe records it from the "Khasia Hills" (Tr. Ent. Soc. 1893, 314). Mr. J. Wood-Mason obtained five males and one female at Silcuri and its neighbourhood, Cachar, from April to August" (J. As. Soc. Beng. 1886, 377). In Sikkim it is "only found in the Terai and the outer hills at low elevations" (H. J. Elwes, Tr. Ent. Soc. 1888, 429). Mr. L. de Nicéville says it is "found in Sikkim, only at low elevations sparingly. Mr. H. C. Dudgeon found the larva at 1500 feet elevation feeding on wild Citron" (Sikkim Gaz. 1894, 173). We possess specimens from General G. Ramsay's Nepal Collection.

It also occurs in Siam ; S. China ; Foochau ; Hongkong ; Hainan ; Formosa.

Of our illustrations on Plate 466, fig. 1 represents the larvæ and pupæ, copied from Sir W. Elliot's original drawings made in Madras ; figs. 1a, b, the male, and 1c, the female.

#### ORPHEILES MALAYANUS.

*Papilio Erithonius*, loc. form *Malayanus*, Wallace, Trans. Linn. Soc. Lond. xxv. p. 59 (1865).

*Papilio Malayanus*, Butler, *id. l.c.* 1877, p. 552.

*Papilio Erithonius*, var. *Malayanus*, Distant, Rhop. Malay, p. 350, pl. 27, B, fig. 6 (1885).

*Orpheides Malayanus*, Moore, Journ. Linn. Soc. Zool. 1886, p. 50.

*Papilio Demoleus Malayanus*, Rothschild, Nov. Zool. ii. p. 281 (1895).

*Papilio Erithonius*, Butler, Ann. Nat. Hist. 1886, p. 189. Manders, Tr. Ent. Soc. Lond. 1890, p. 536.

Watson, Journ. Bombay N. H. S. 1891, p. 51.

*Papilio (Orpheides) Demoleus*, Watson, Journ. Bombay N. H. Soc. 1897, p. 671.

IMAGO.—Upperside similar to *O. Demoleus*. *Forewing* with the lower-discal oblique spots generally somewhat larger, and the submarginal row comparatively smaller. *Hindwing* with the subbasal band also somewhat broader within the cell, and the row of submarginal spots smaller. Underside with similar differences, as above. *Hindwing* also with broader inner-discal black streaks bordering the medial-discal rich ochreous-yellow interspaces.

Expanse  $3\frac{1}{4}$  to  $3\frac{3}{4}$  inches.

HABITAT.—Burmah; Malay Peninsula.

DISTRIBUTION.—Col. C. H. E. Adamson records this as the “commonest *Papilio* in Central Burma” (List, 1897, 48). Capt. E. Y. Watson found it “common in the N. Chin Hills, but not noticed above 3000 feet elevation” (J. Bombay N. H. S. 1897, 671). He also obtained it during the Chin-Lushai Expedition of 1889-90 at “Pokoko in October, at Pauk in September, and at Tilin in November and December” (id. *l.c.* 1891, 54). Commander A. Carpenter, R.N., obtained it at “Myadoug and Mandalay, Upper Burma, in January” (Ann. N. H. 1886, 189). Dr. N. Manders found it very common in the Shan States, Burma, especially at low elevations” (Tr. Ent. Soc. 1890, 536). Signor L. Fea took it in the Karen Hills and at Bhamo, in October. Dr. J. Anderson obtained it in “Mergui, Tenasserim, in December” (J. Linn. Soc. Zool. 1886, 50). Mr. L. de Nicéville records “two males from Tavoy, Tenasserim, taken in March” (J. A. S. Beng. 1887, 438). Mr. A. R. Wallace took it at Singapore, and Mr. W. L. Distant in the “Malay Peninsula” (*l.c.* 351).

ALLIED SPECIES.—*Orpheides Annamiticus* (Pap. *Demoleus*, *subsp.* *Annamiticus*, Fruhstorfer, Deuts. Ent. Zeit. Iris, 1901, p. 271, *ib.* Berl. Ent. Zeit. 1902, p. 171.

HABITAT.—S. Annam.



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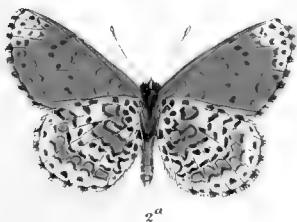
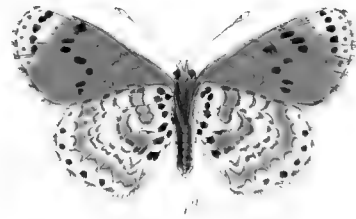
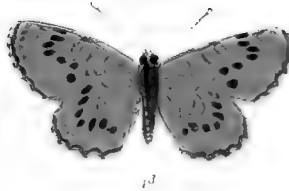


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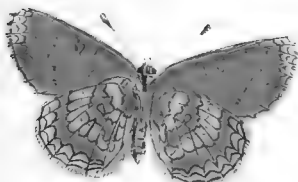
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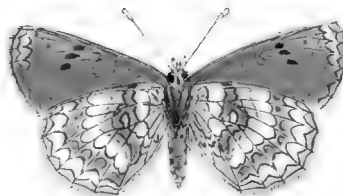
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2b



3a



2c



4



4a



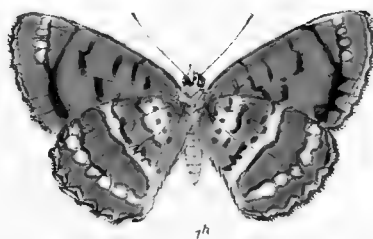
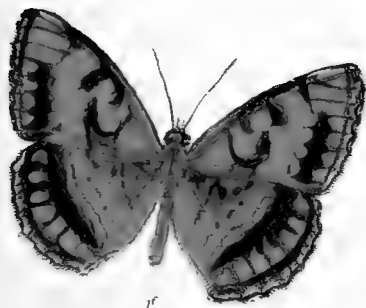
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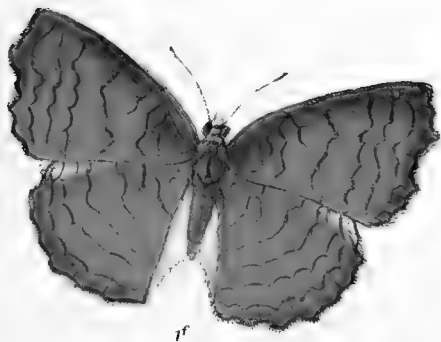
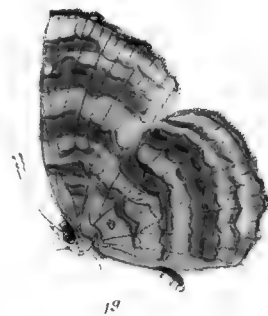
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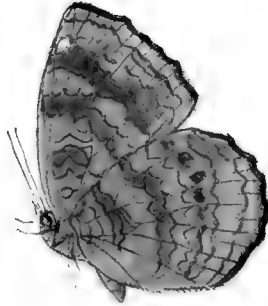




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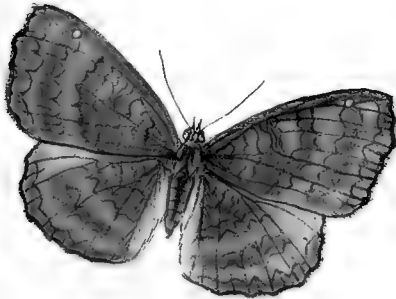
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1a



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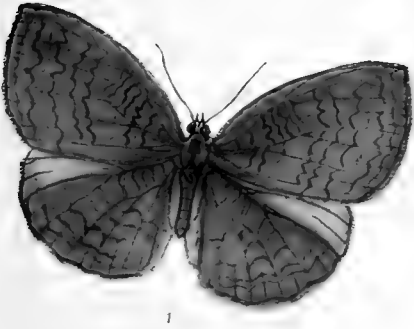


1d



1f





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1b



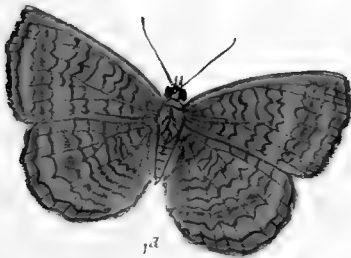
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1f







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1b



1a



1c



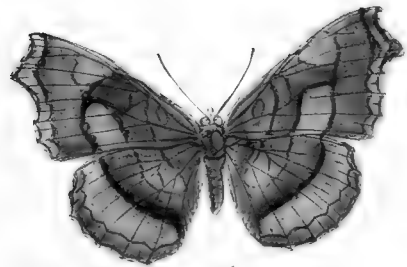
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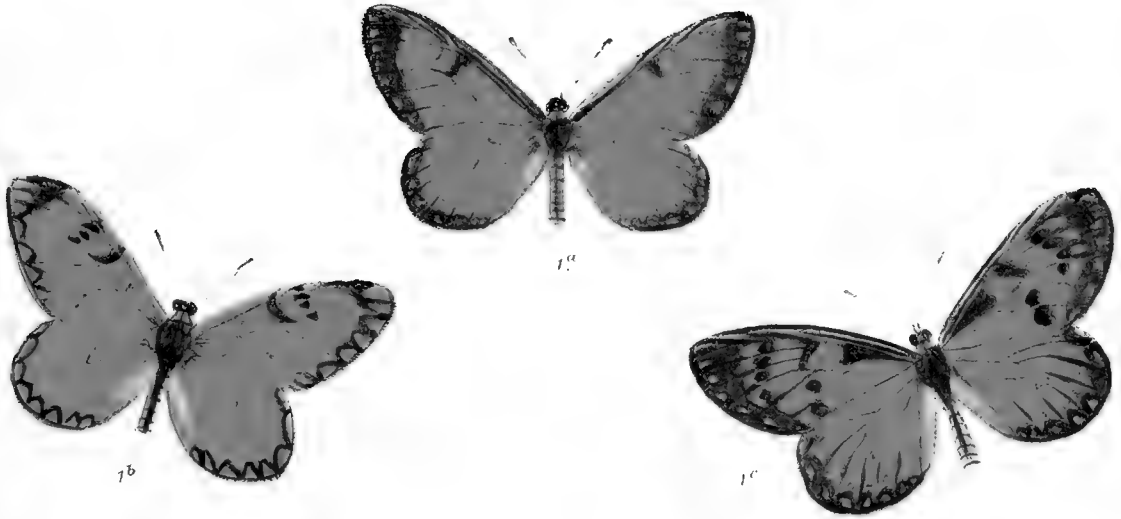


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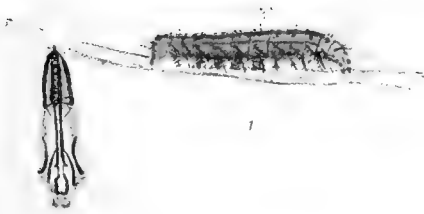
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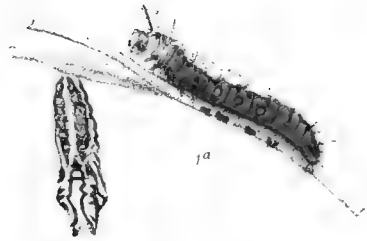
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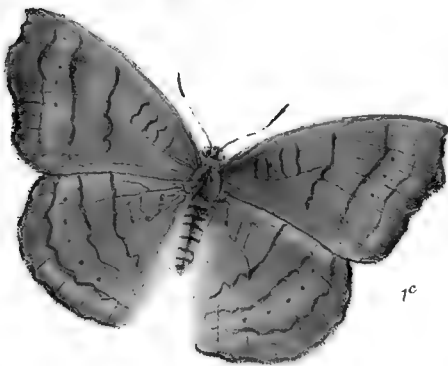




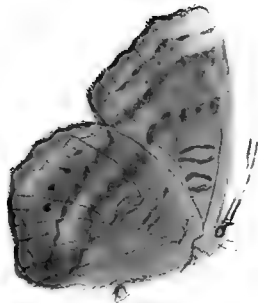
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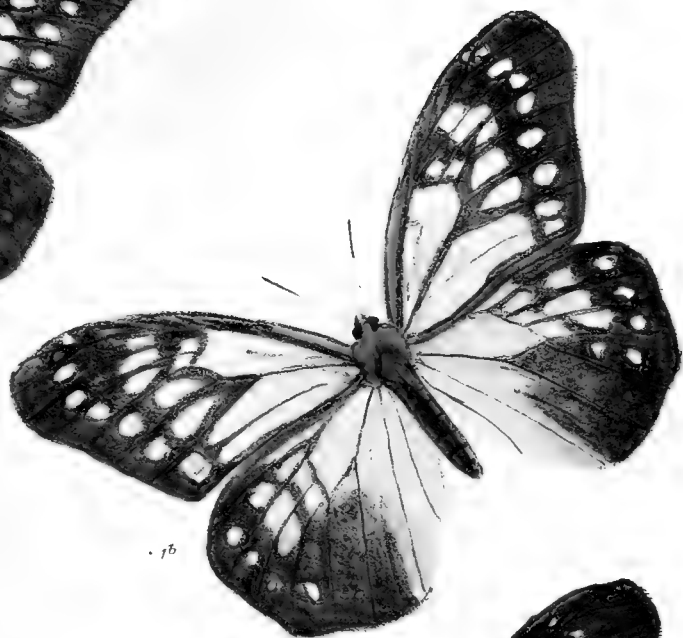


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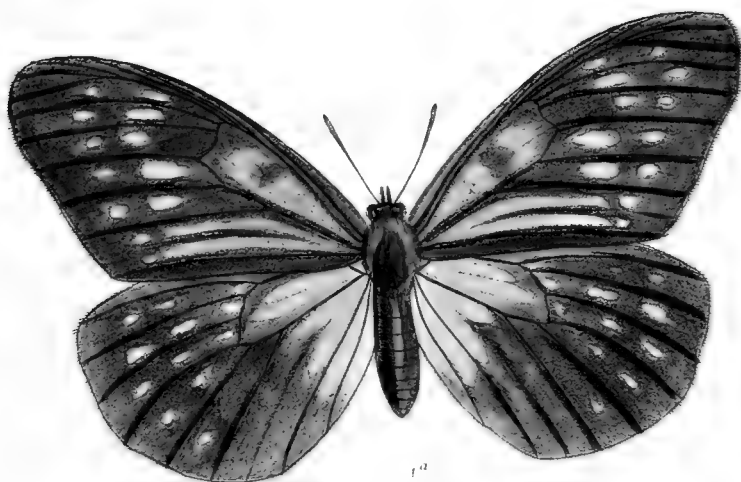








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1<sup>a</sup>



2<sup>a</sup>

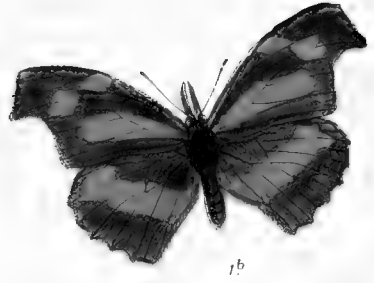


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1881

1881





J.N. Fitch del et lith

Vincent Brooks Day & Son Lith



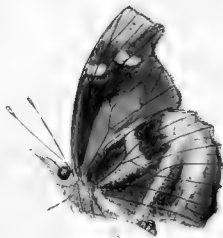




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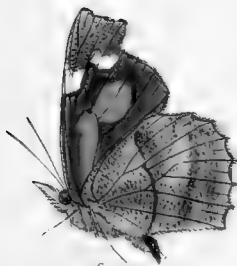
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2a



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2c



2b



2d





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1a



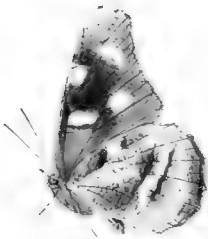
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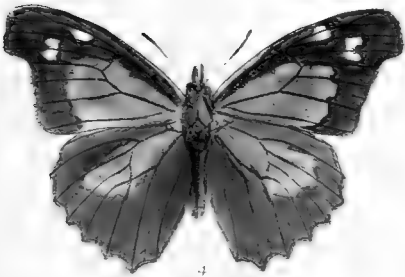
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3a



5a

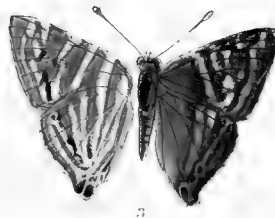
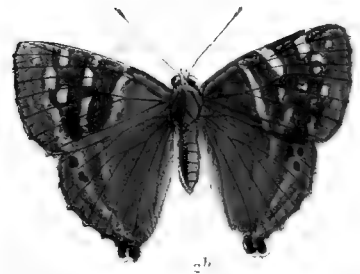
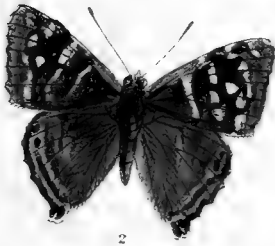
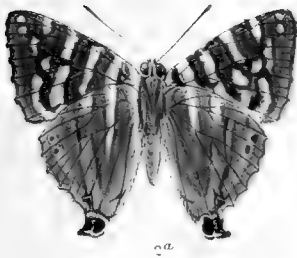
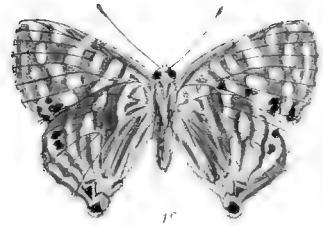
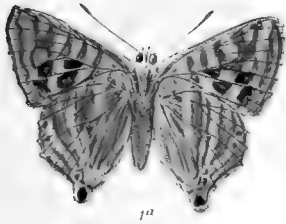
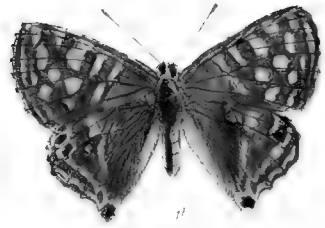


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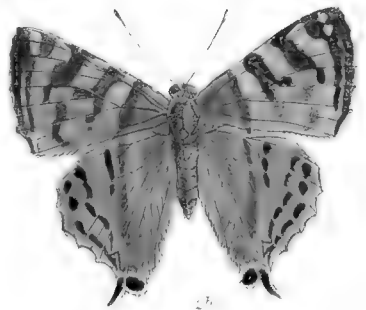
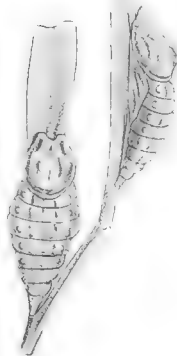
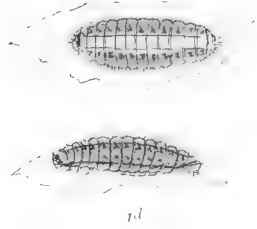
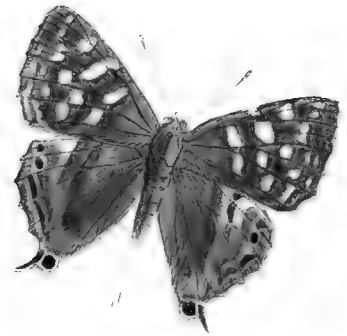


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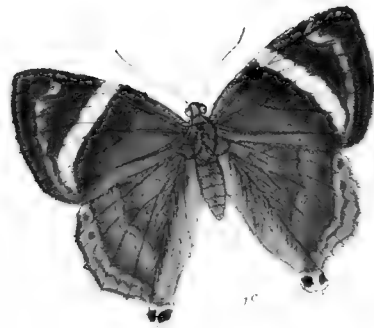
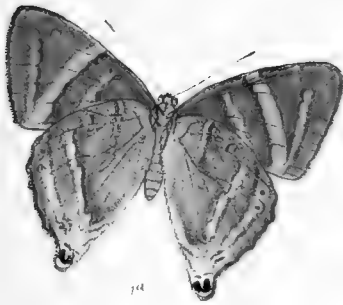
















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3a



3b

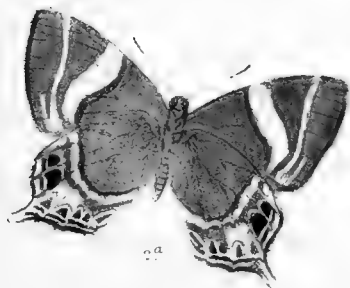
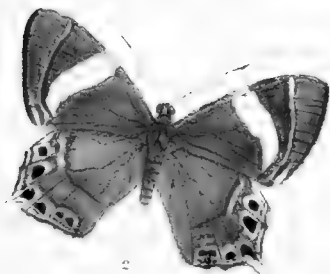
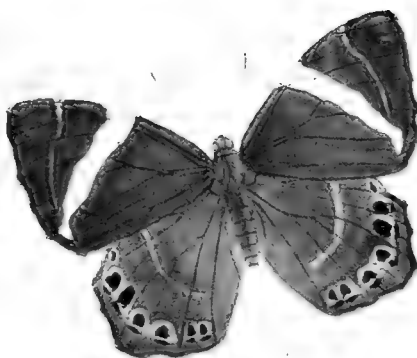


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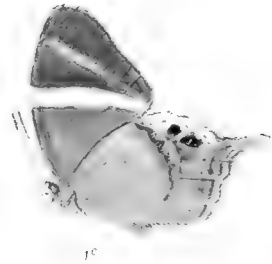
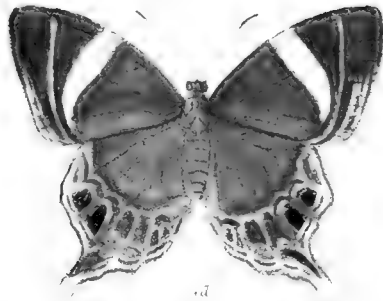




F.C. Moore del. et lith.

Vincent Brooks Del. & Lith.



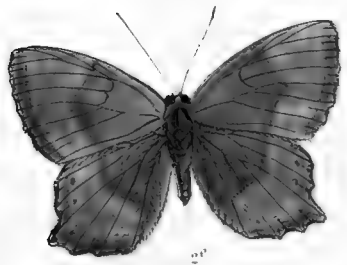
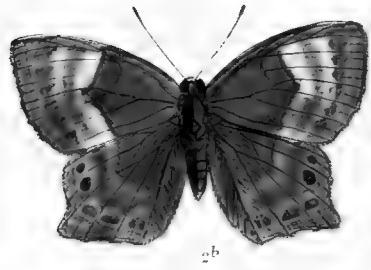


F.C. Moore del. et lit.

Vincent Brooks Day & Son Ltd Imp.



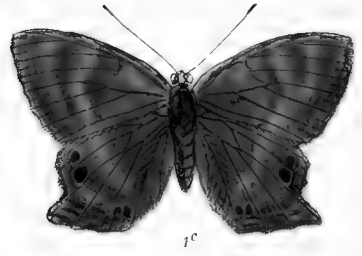
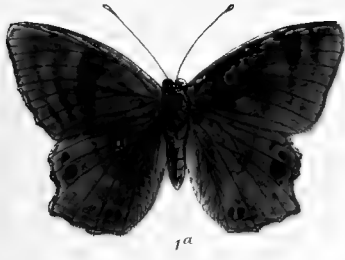




W. Fitch del et lith

V. Leese del et lith. J. G. Rehn sculp

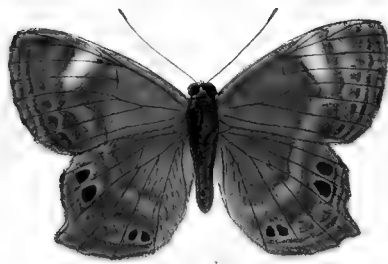








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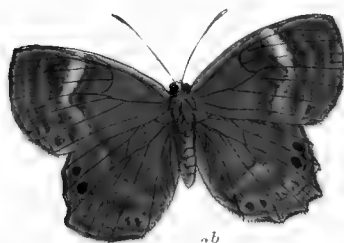
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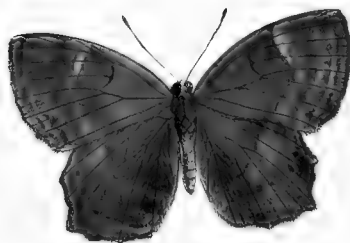
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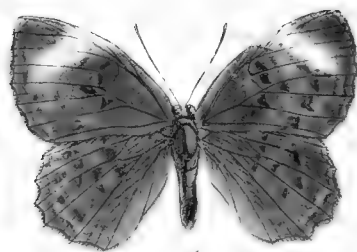


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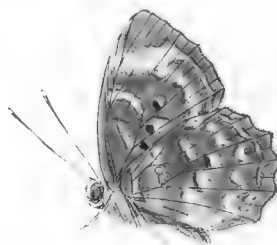
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1b



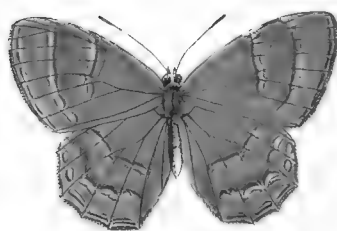
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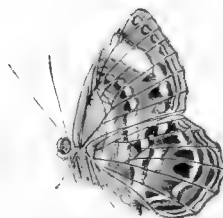
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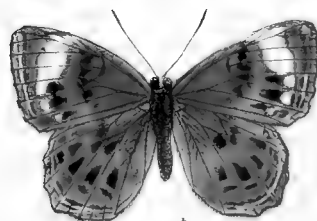
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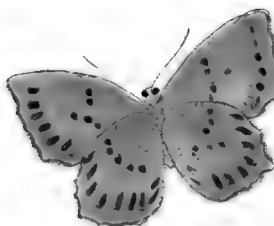
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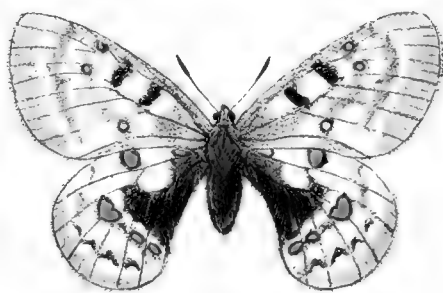
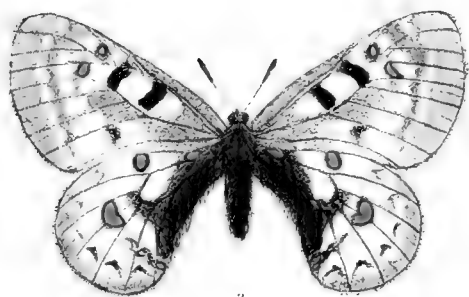
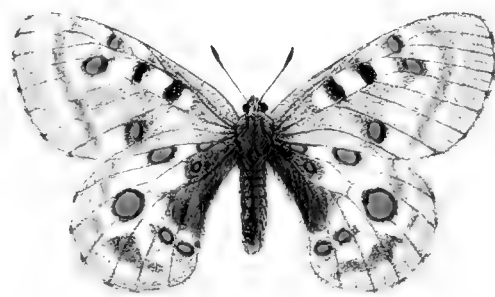
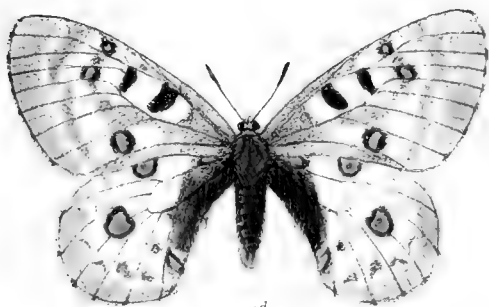
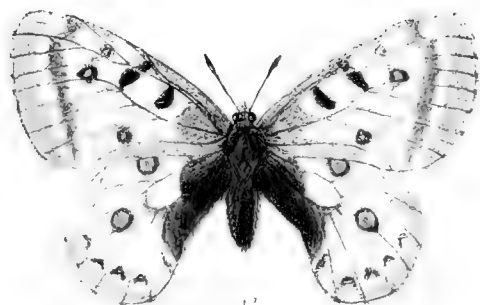
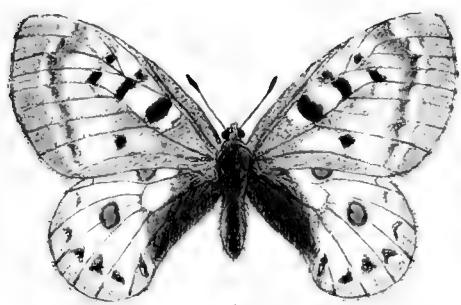
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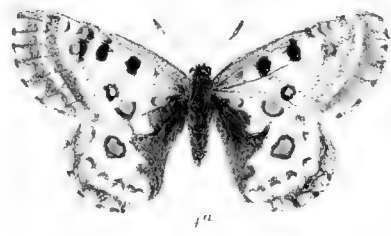




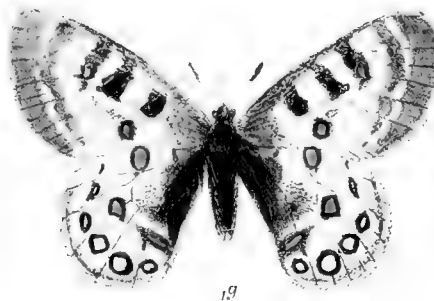
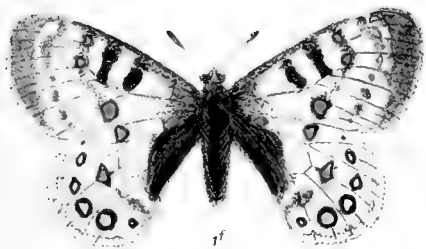
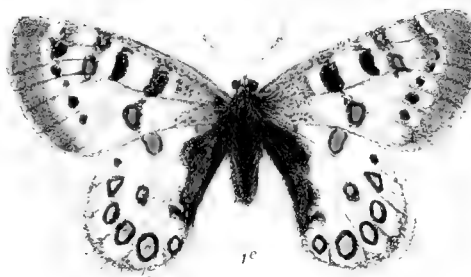
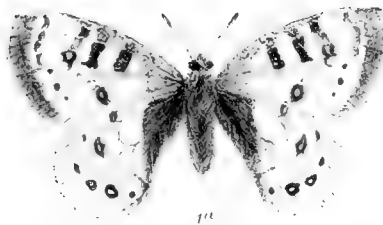






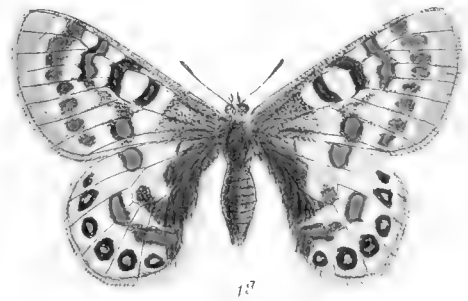
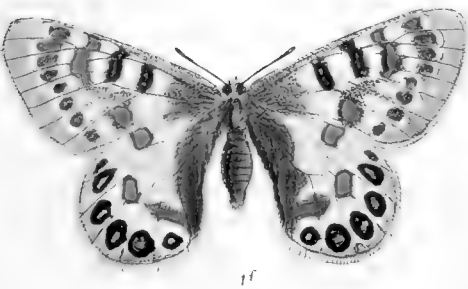
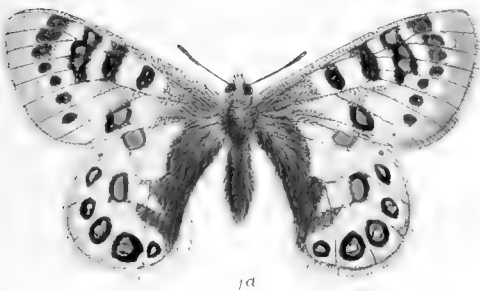
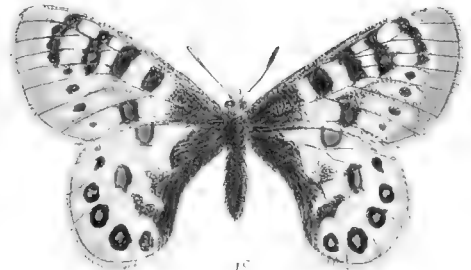
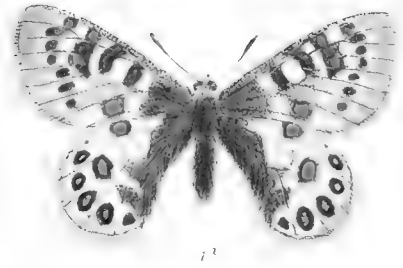
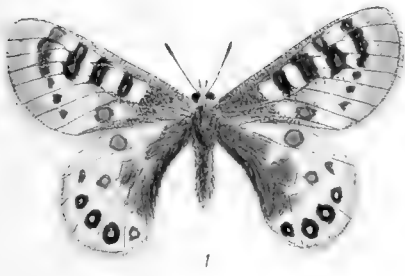




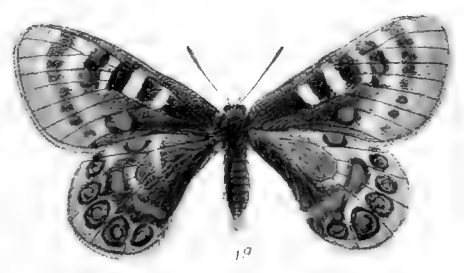
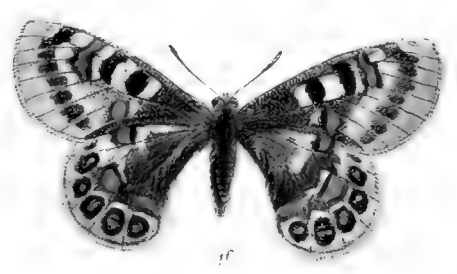
















114

115



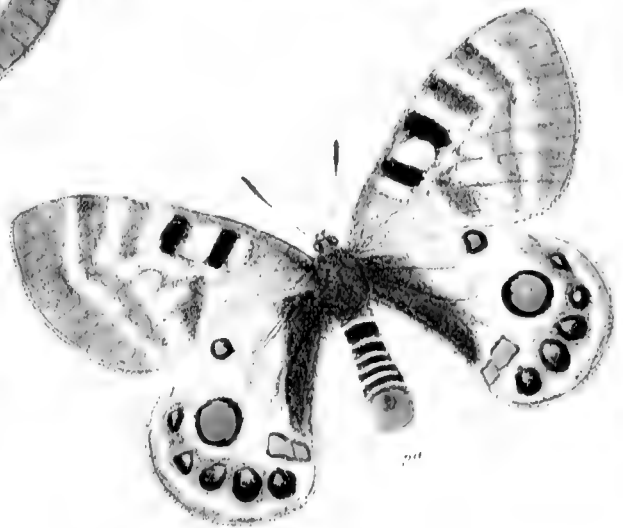
116



117

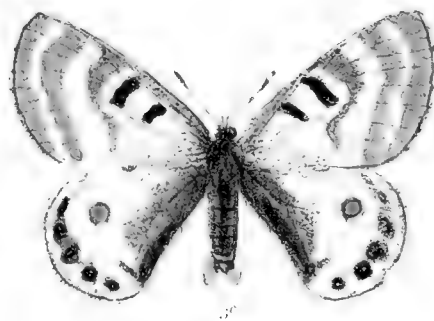
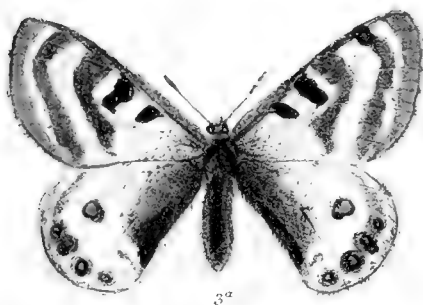
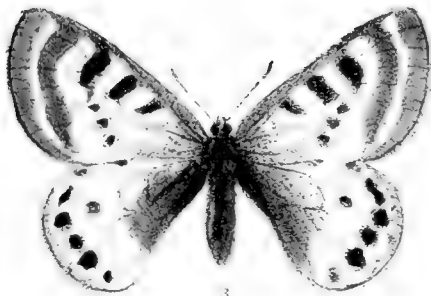


118



119







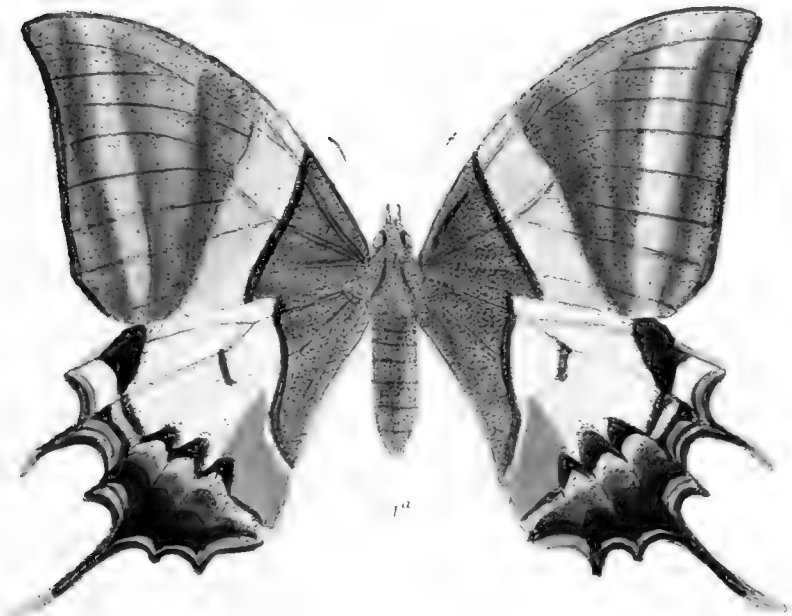
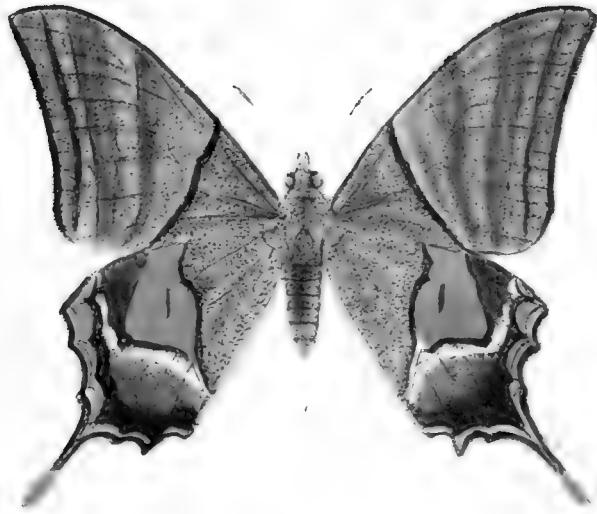




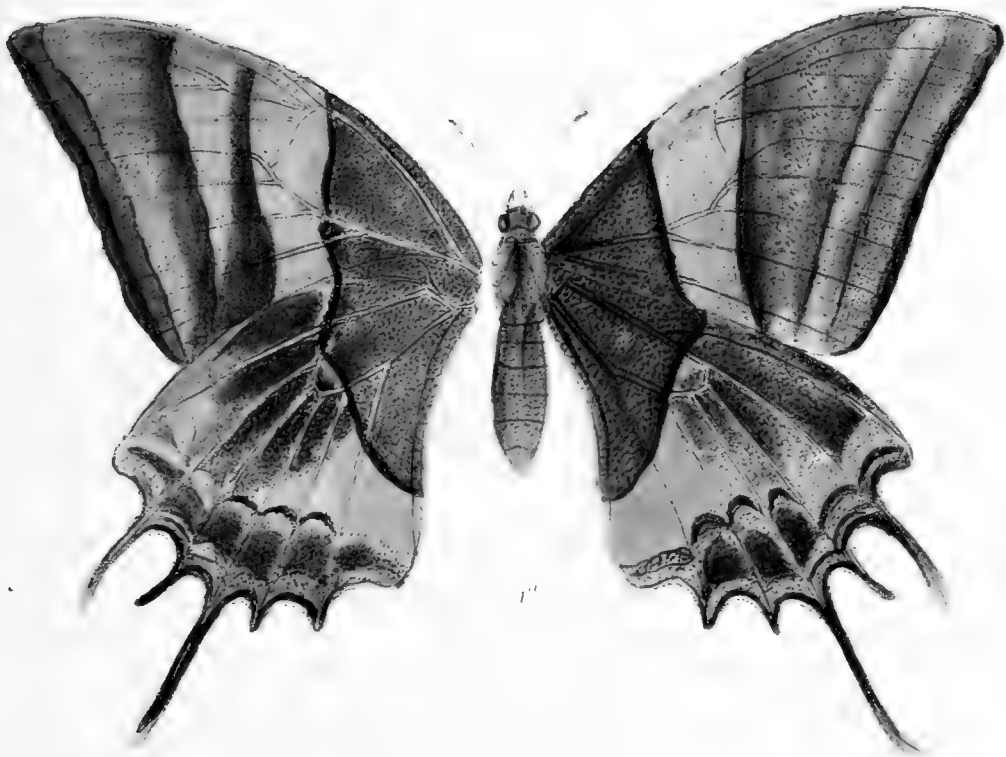






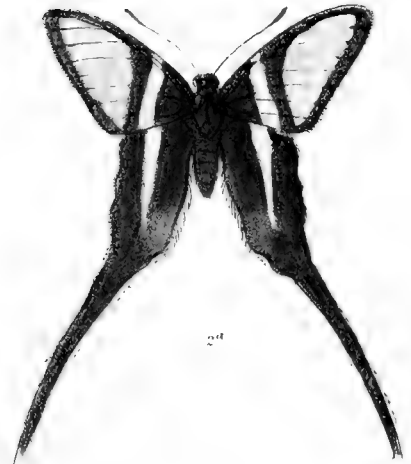
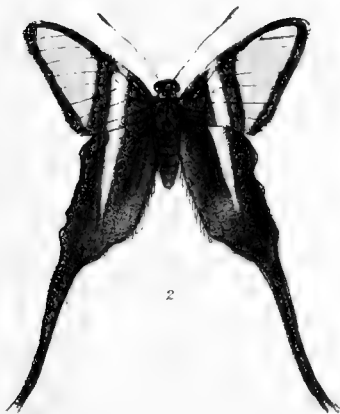








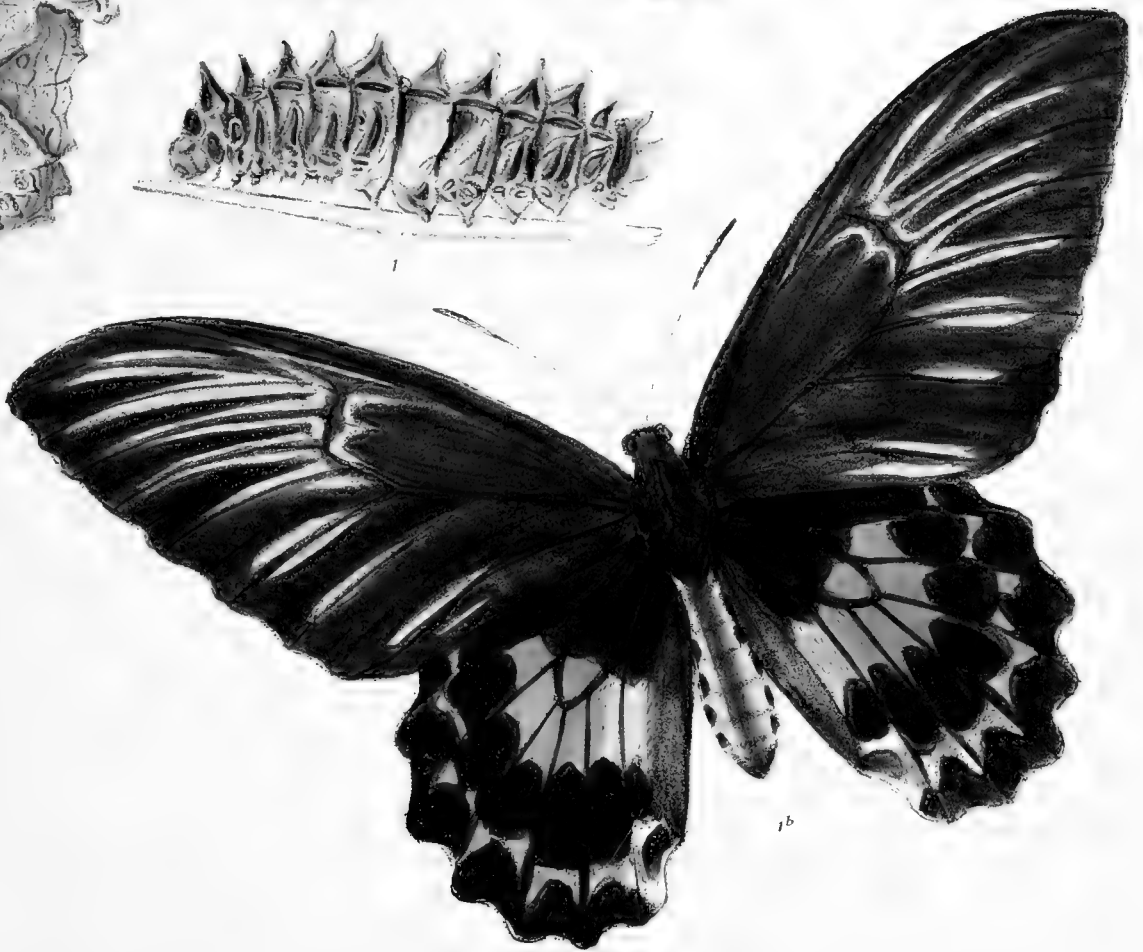
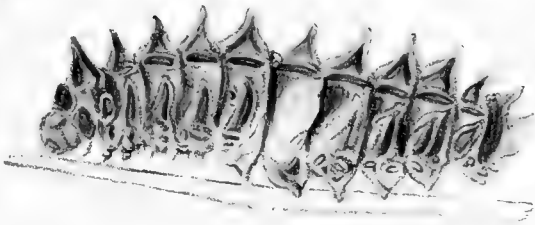








1a

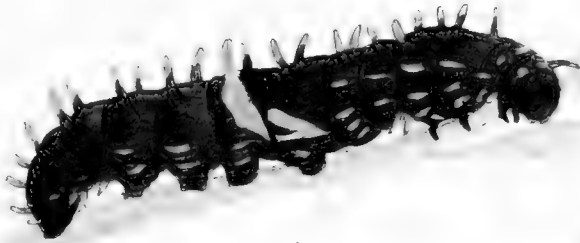
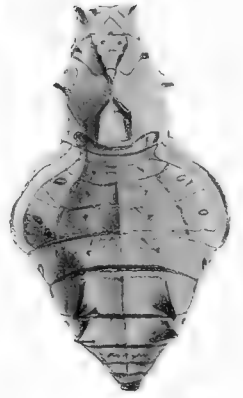
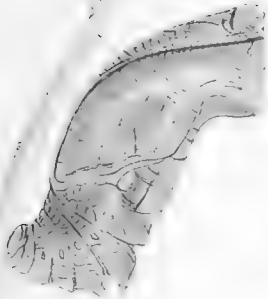


1b





1a



1b





1

1a



1b

1c







1

11



1b

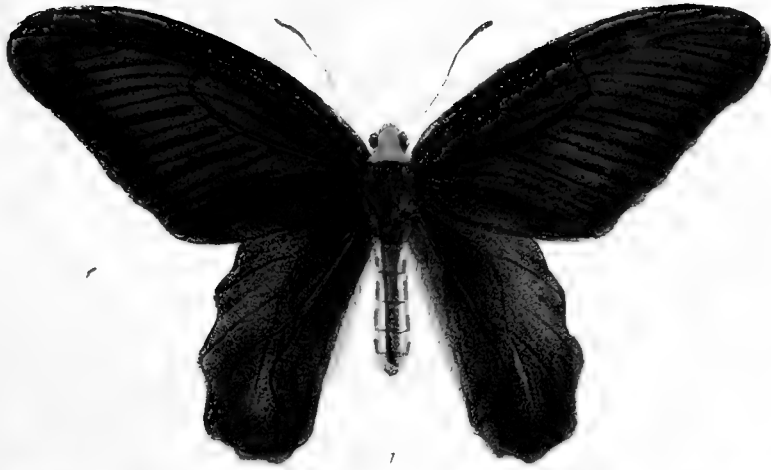
1c



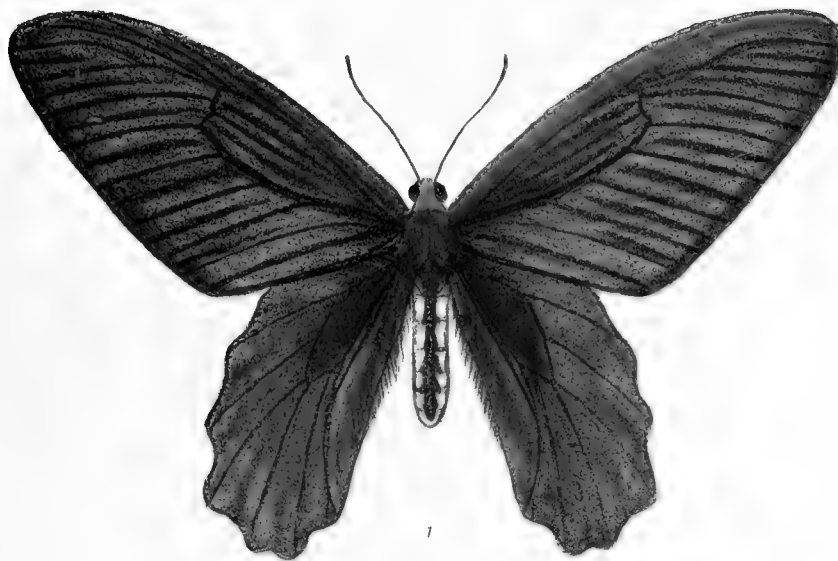


12



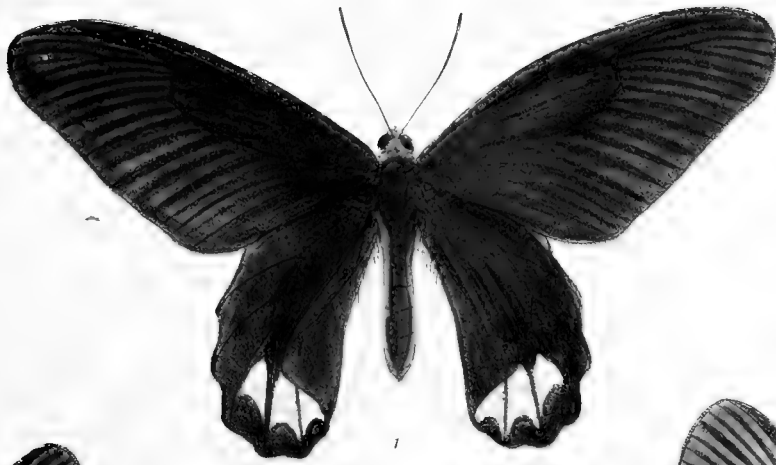












1



1<sup>a</sup>

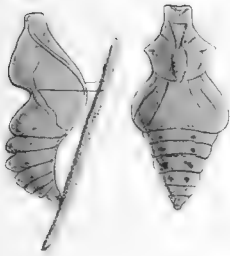
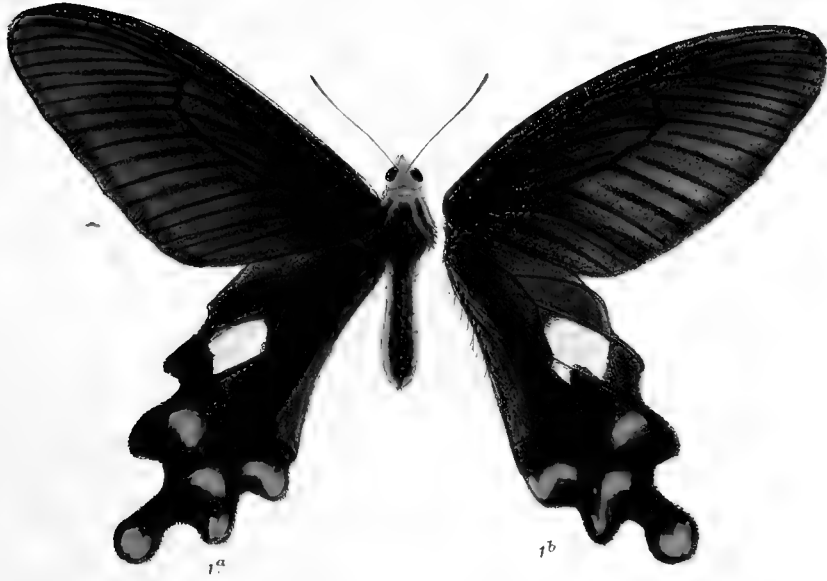


1<sup>c</sup>

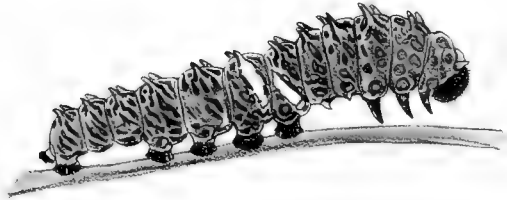


1<sup>b</sup>

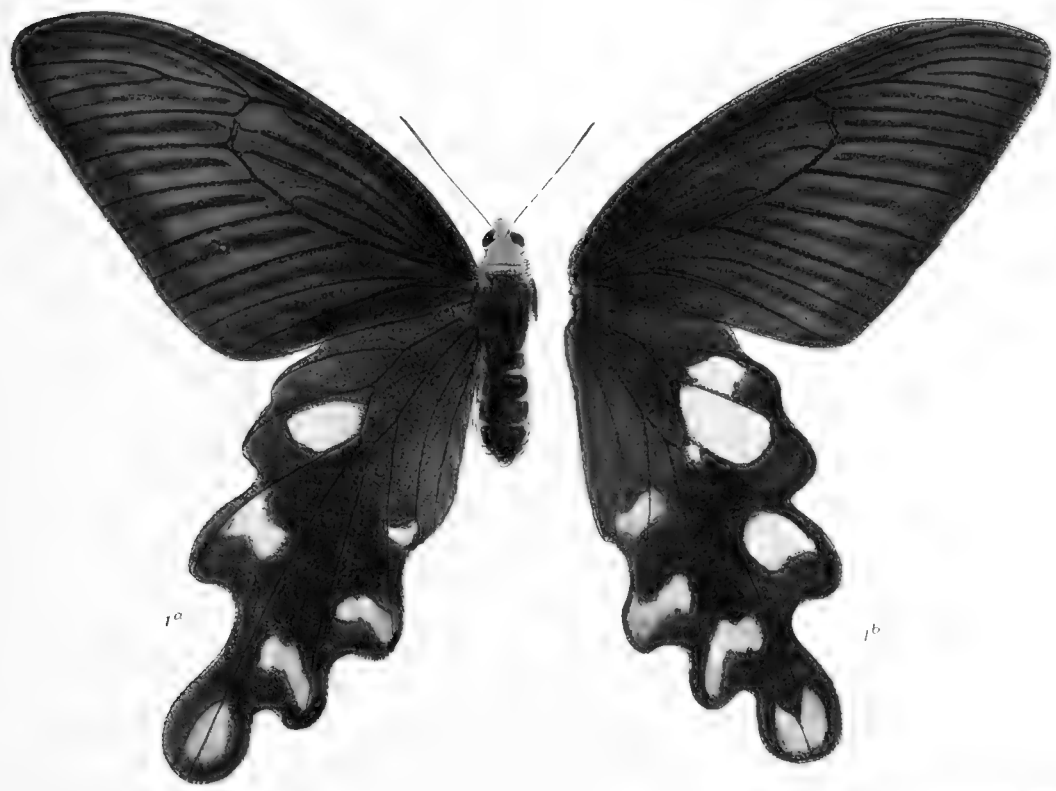
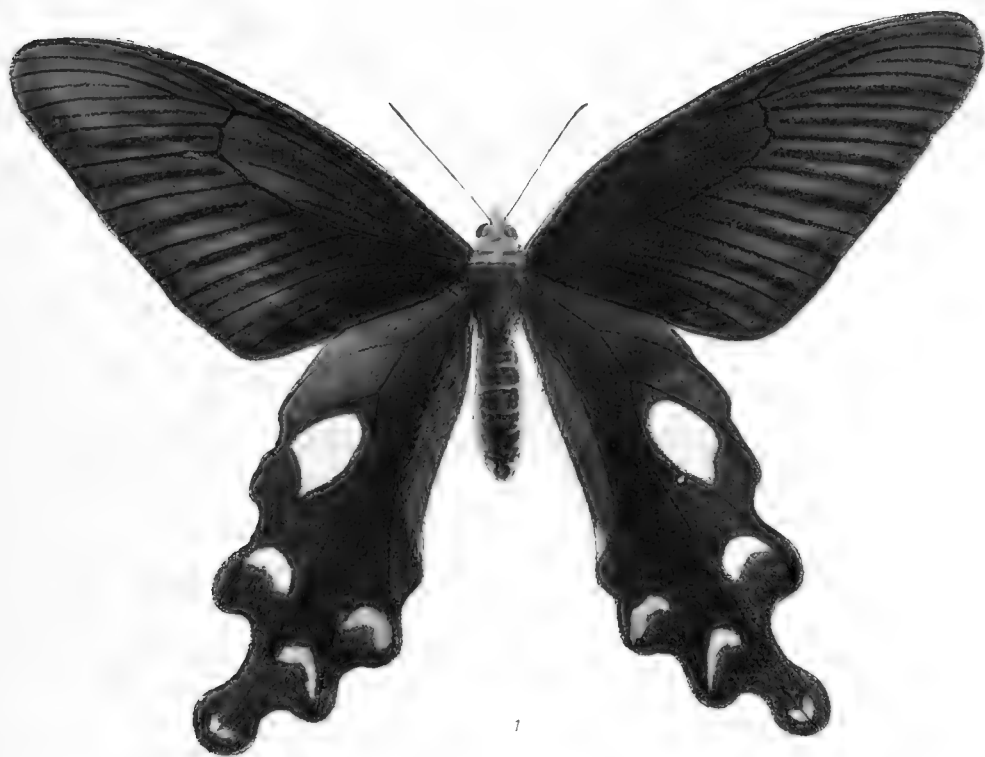




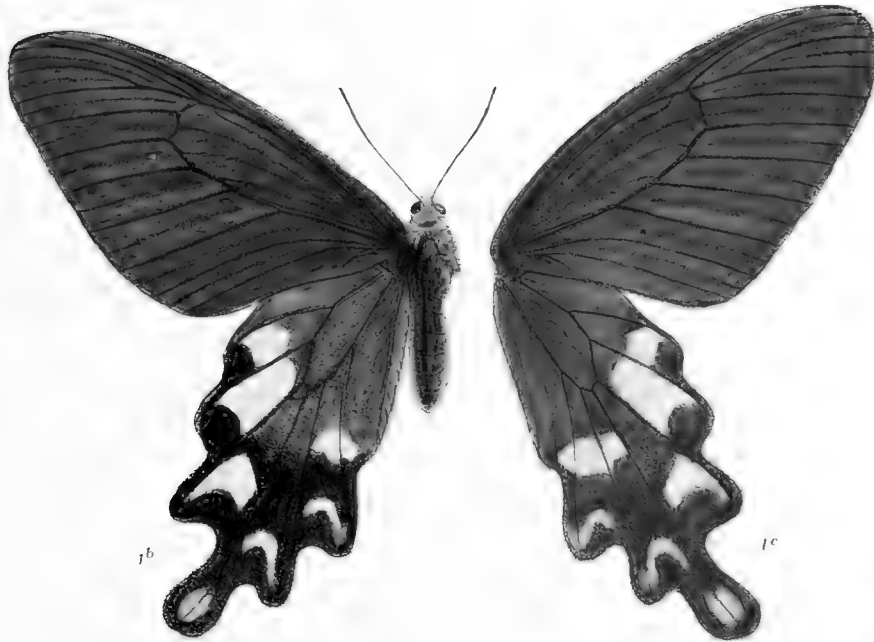
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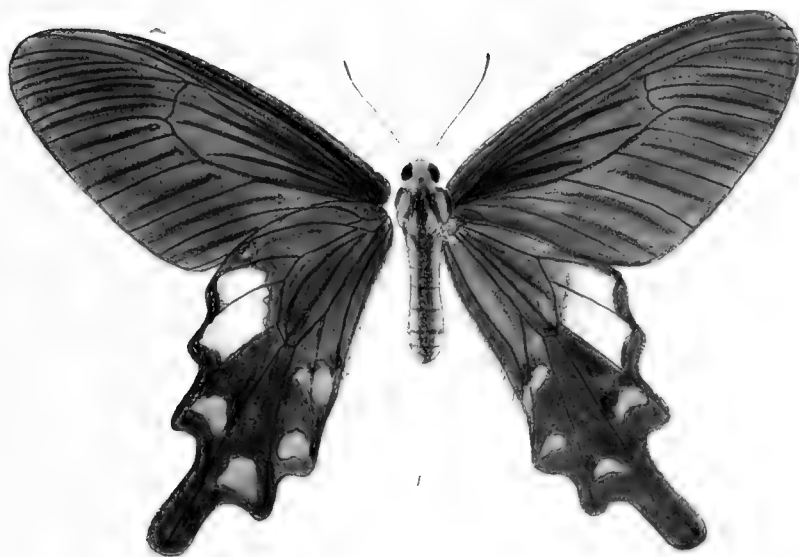




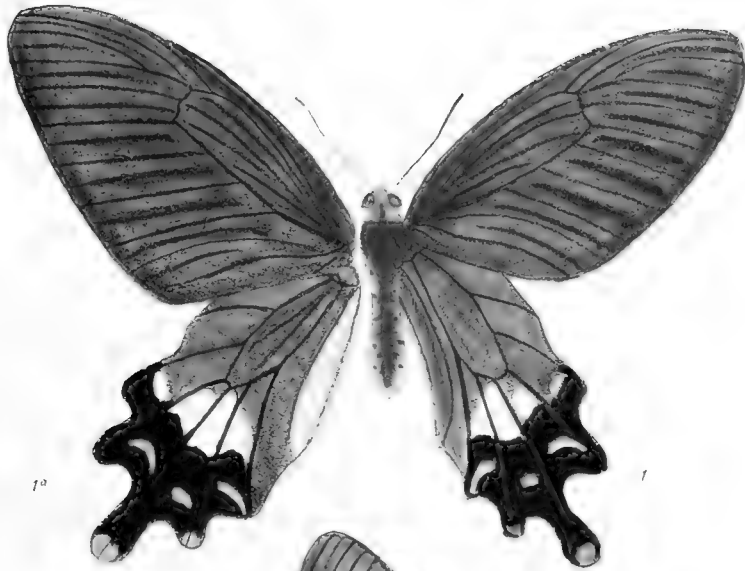






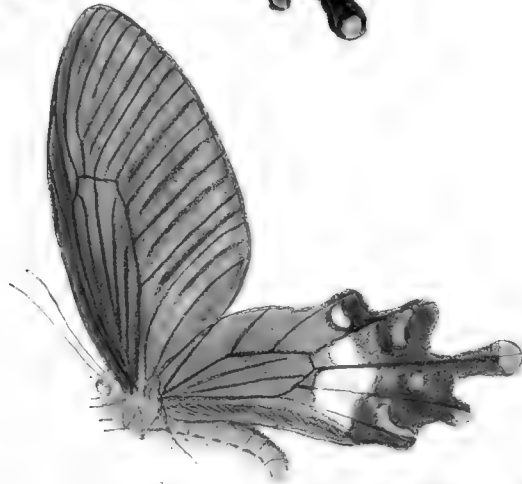




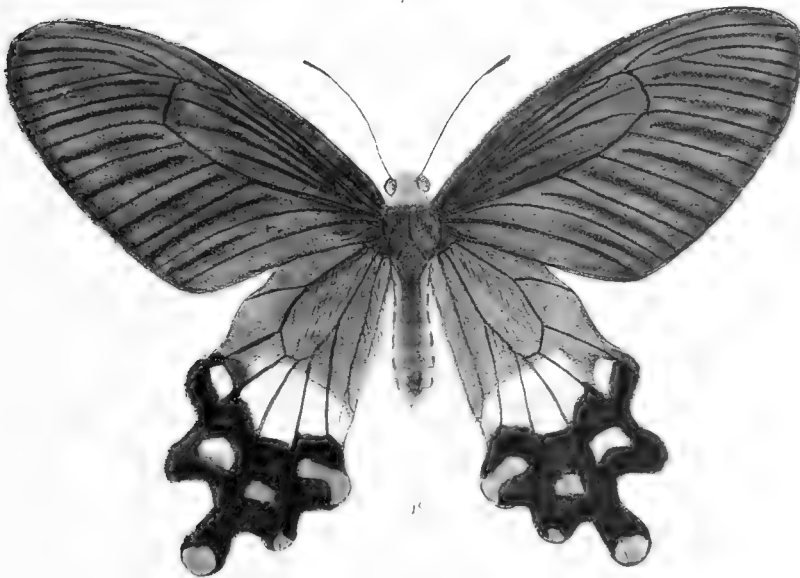


70

71

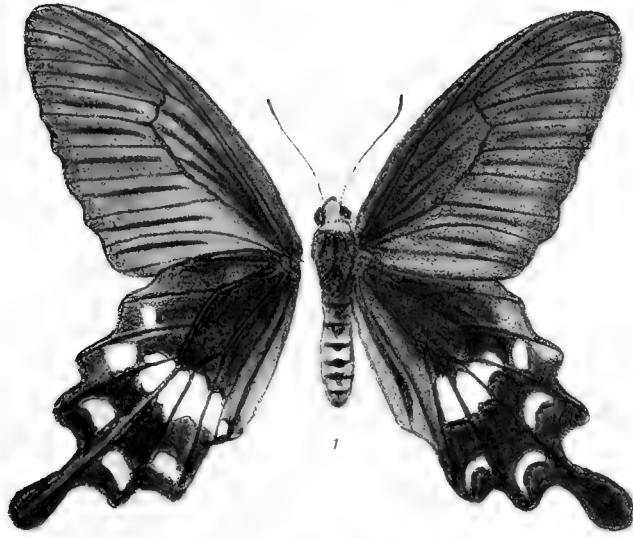


72

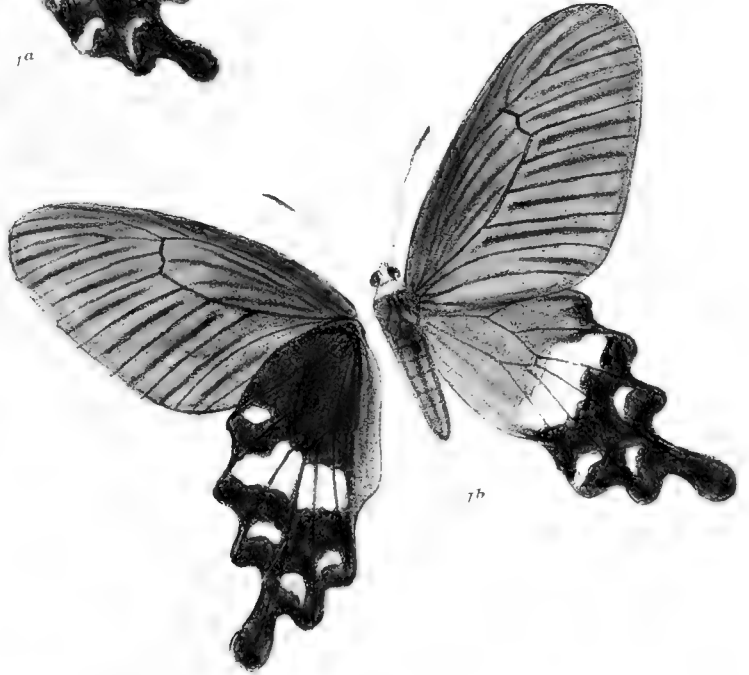


73





1a



1b





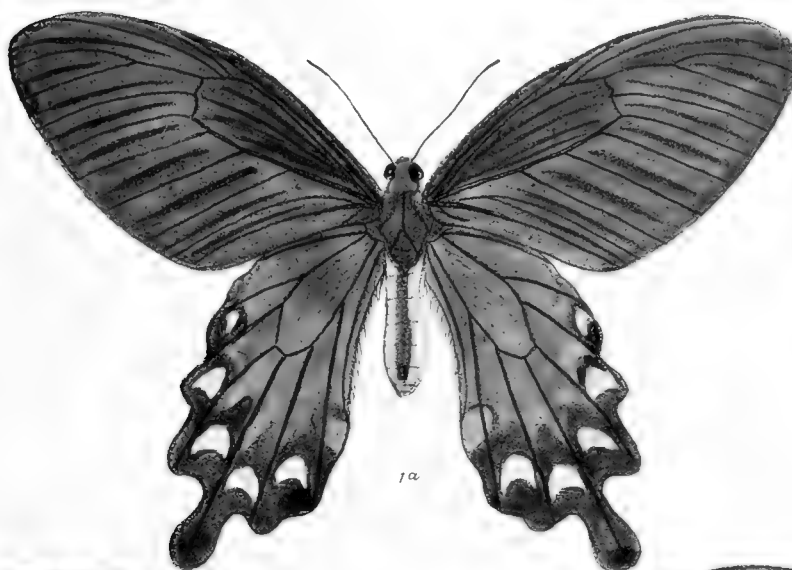
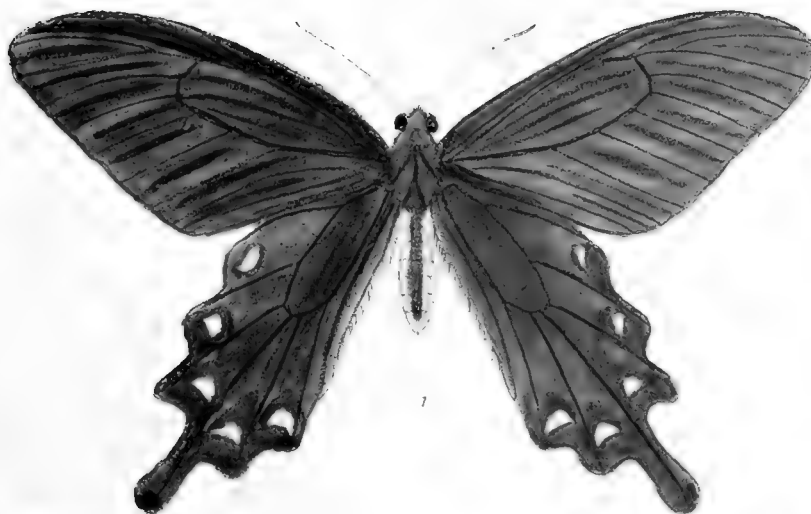




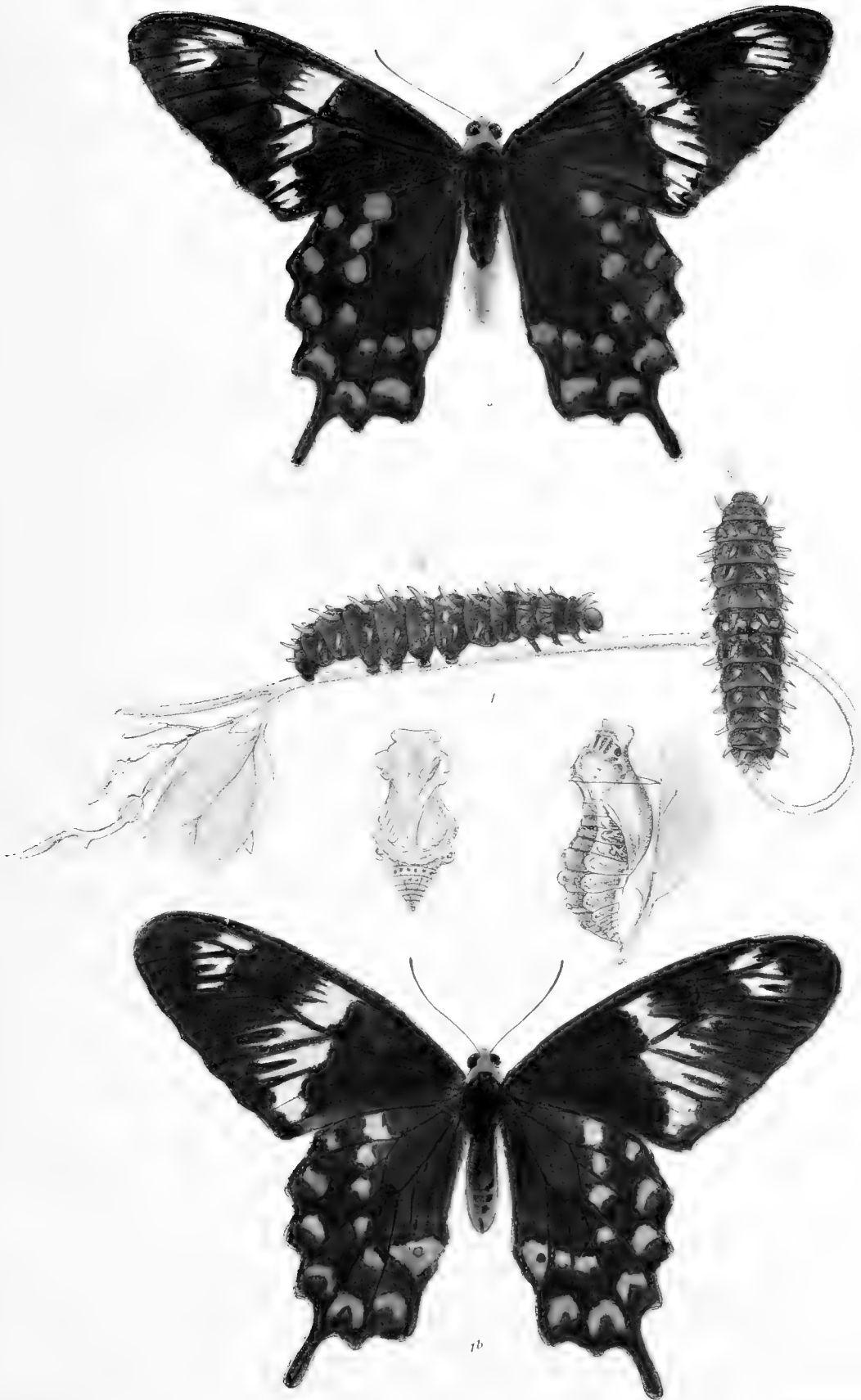


F.C. Moore del et lith

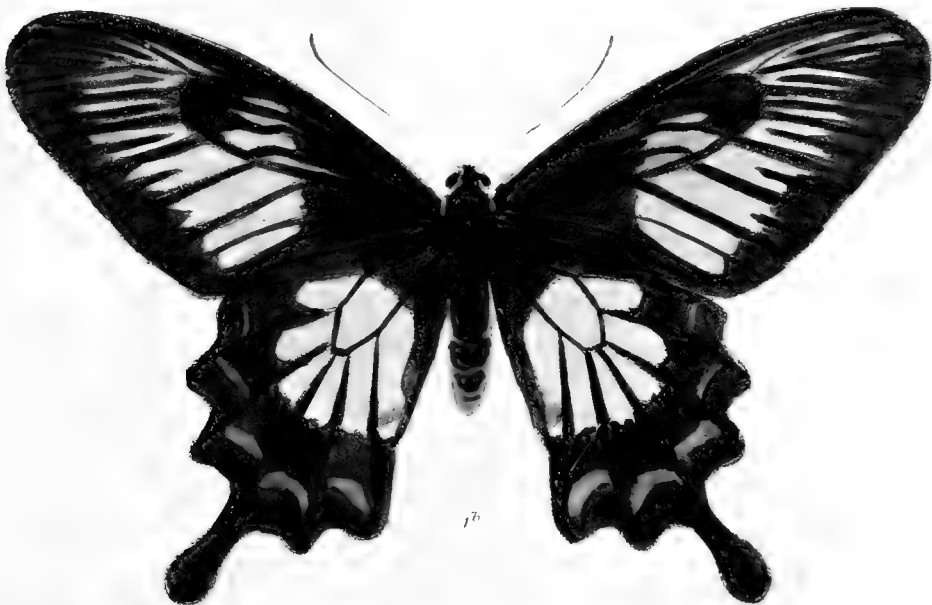
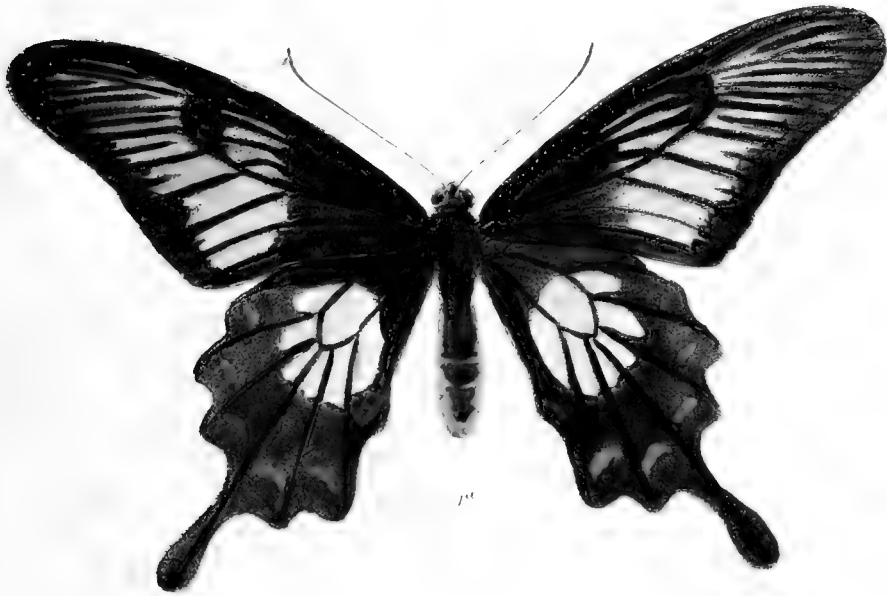


















F. T. Moore del. et lith.

W. H. Wood engraver.





1<sup>a</sup>

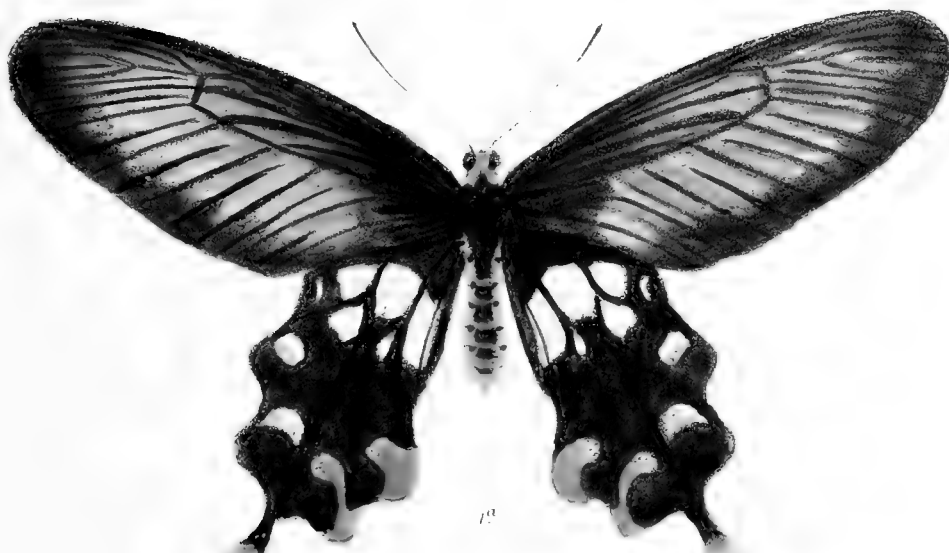


1<sup>b</sup>



















1

1<sup>a</sup>

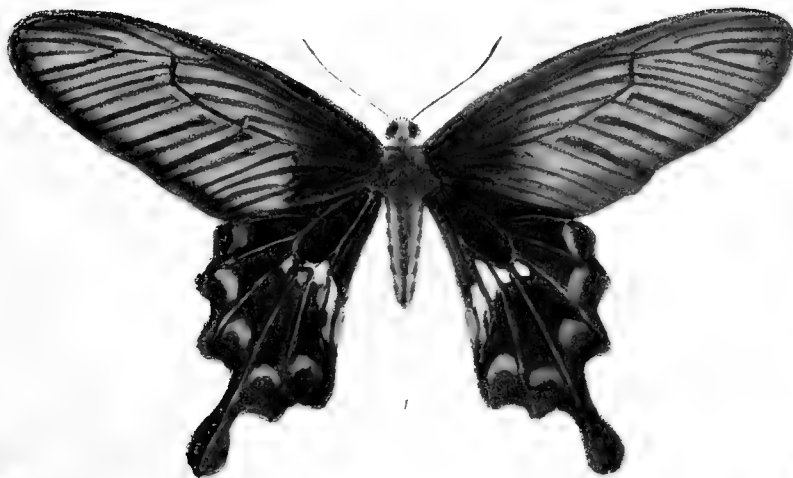


1<sup>b</sup>



1<sup>c</sup>





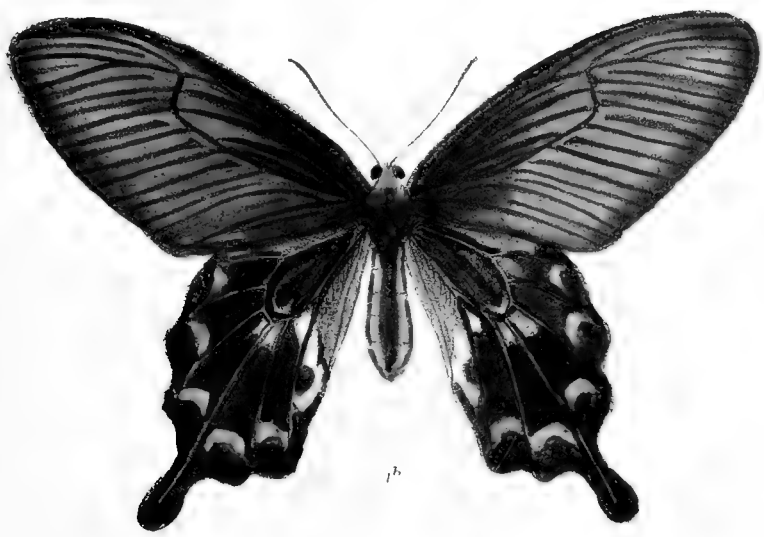
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1<sup>a</sup>

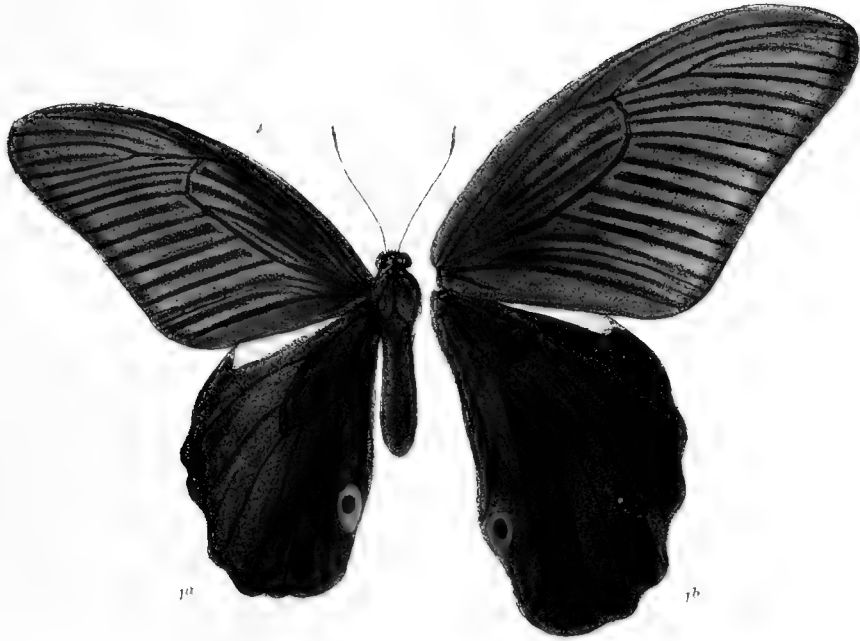


1<sup>b</sup>



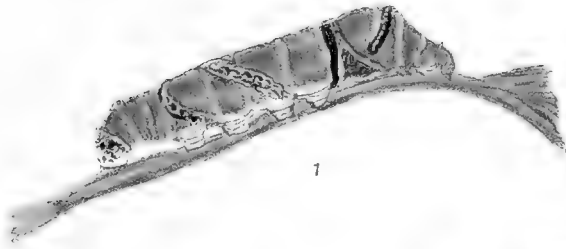
1<sup>b</sup>





1a

1b



1c

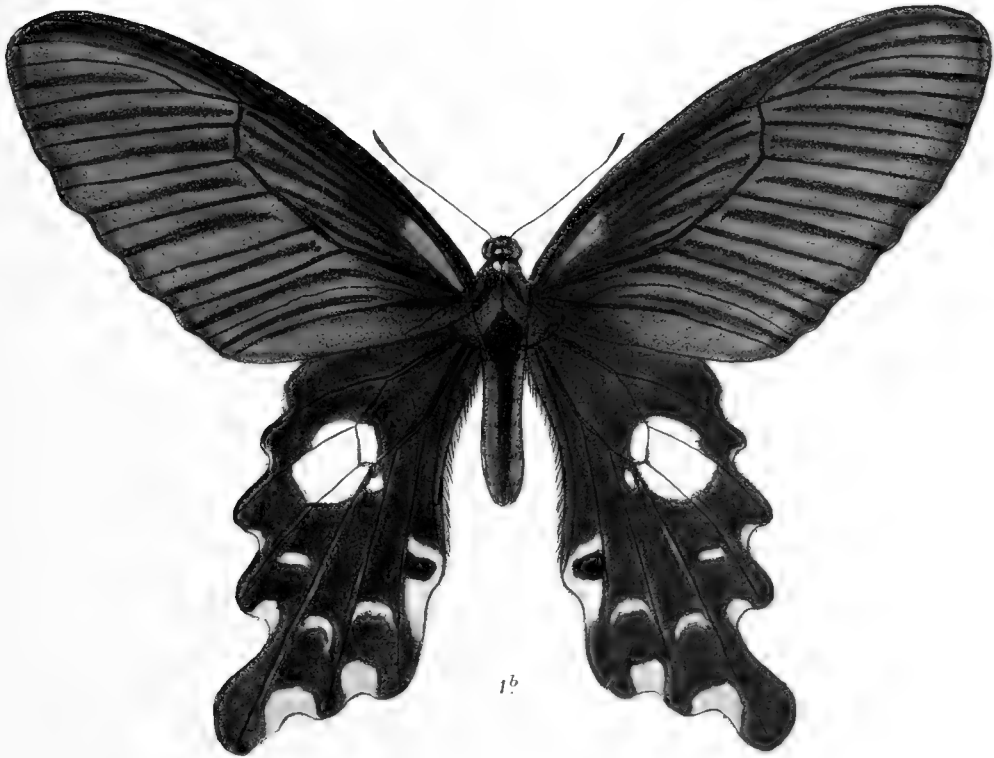
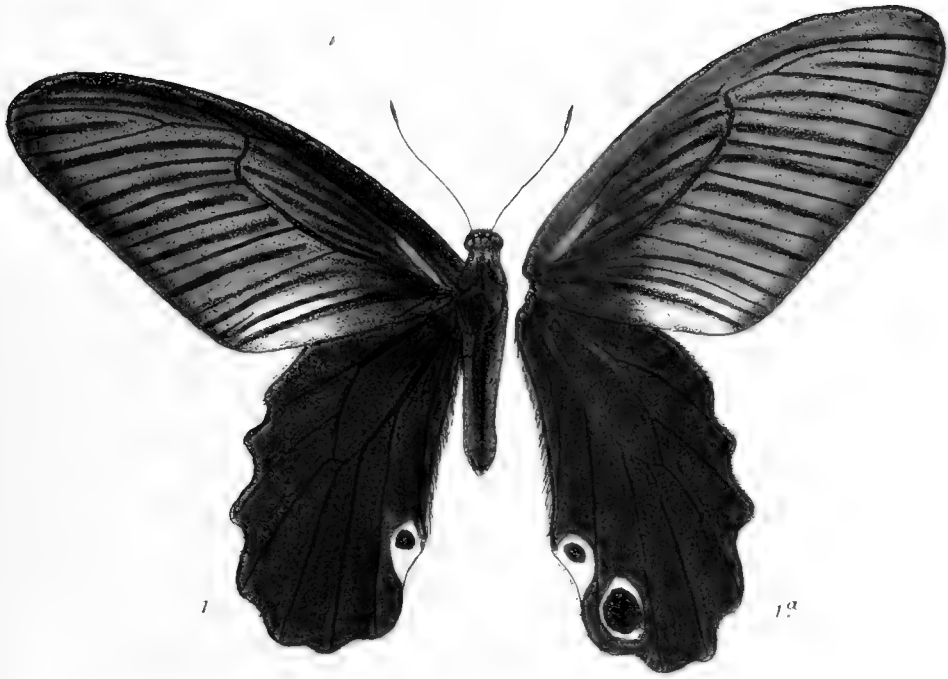


1c

1d











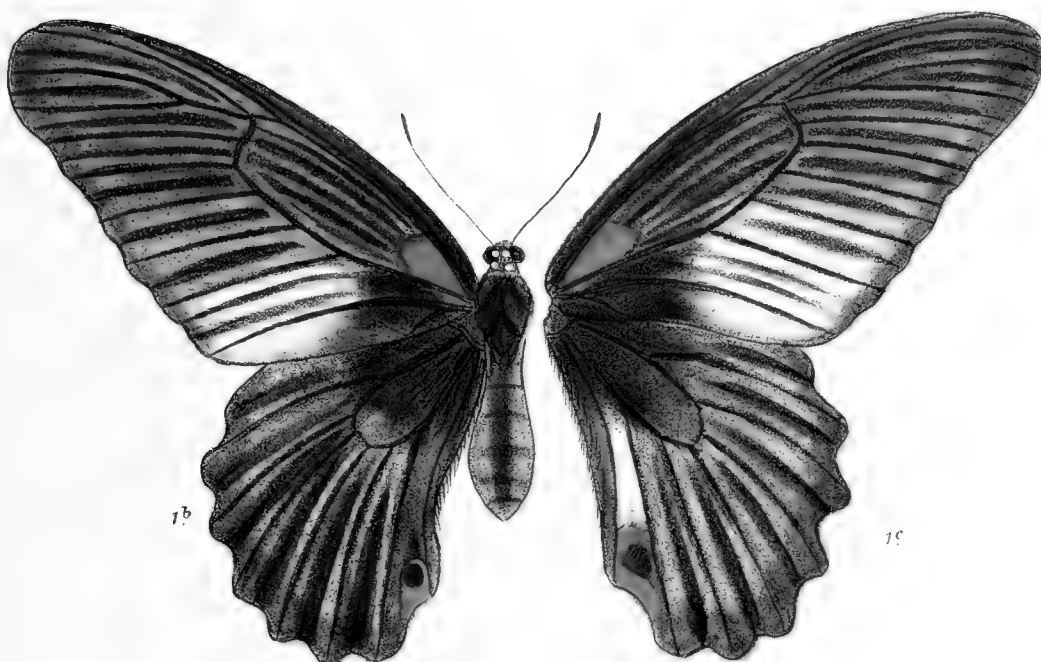
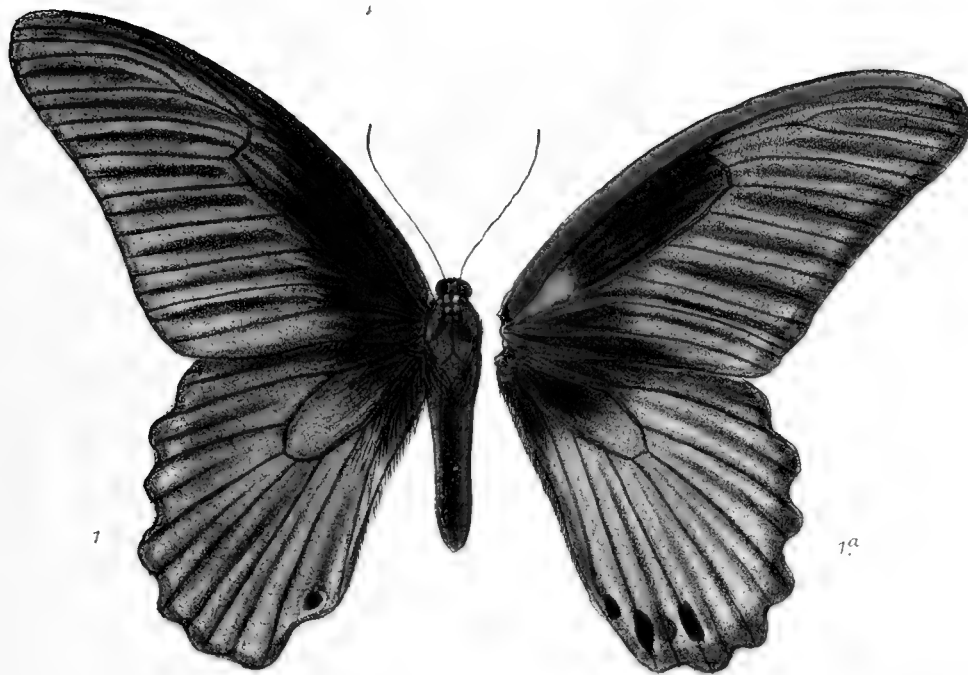
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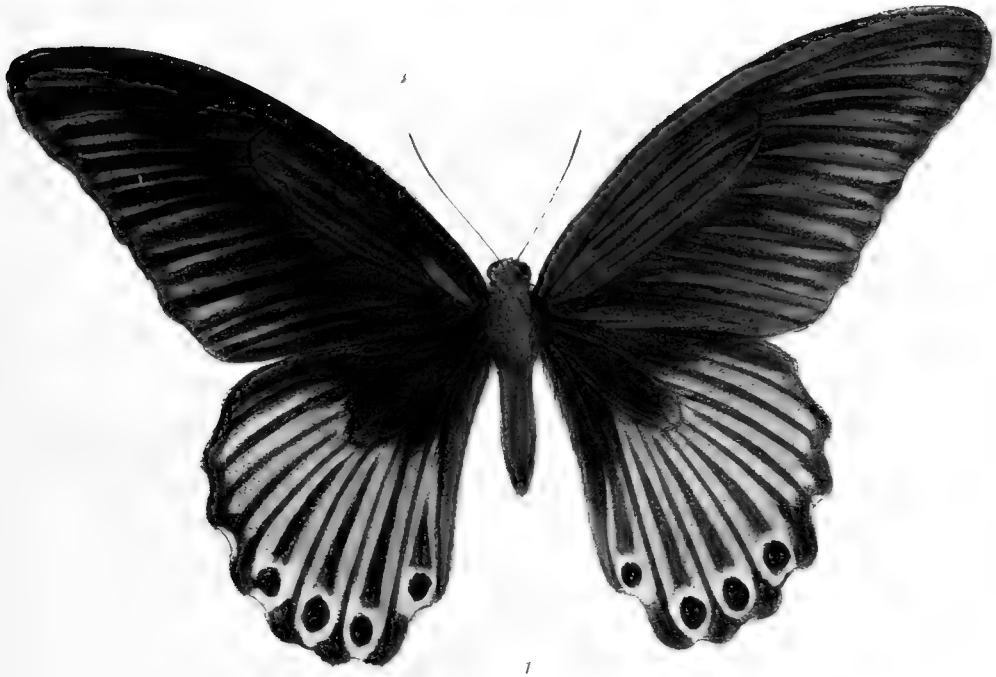
1<sup>a</sup>

1<sup>b</sup>



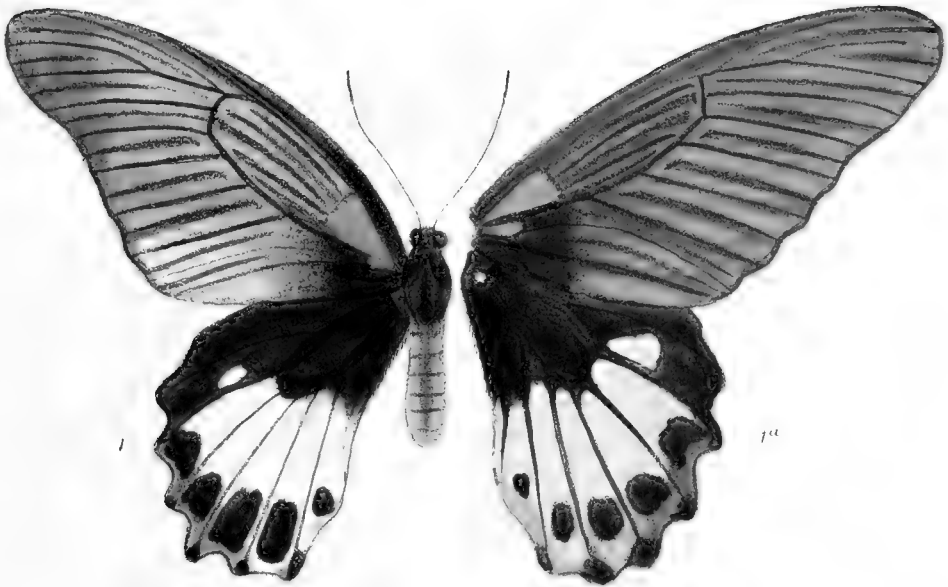




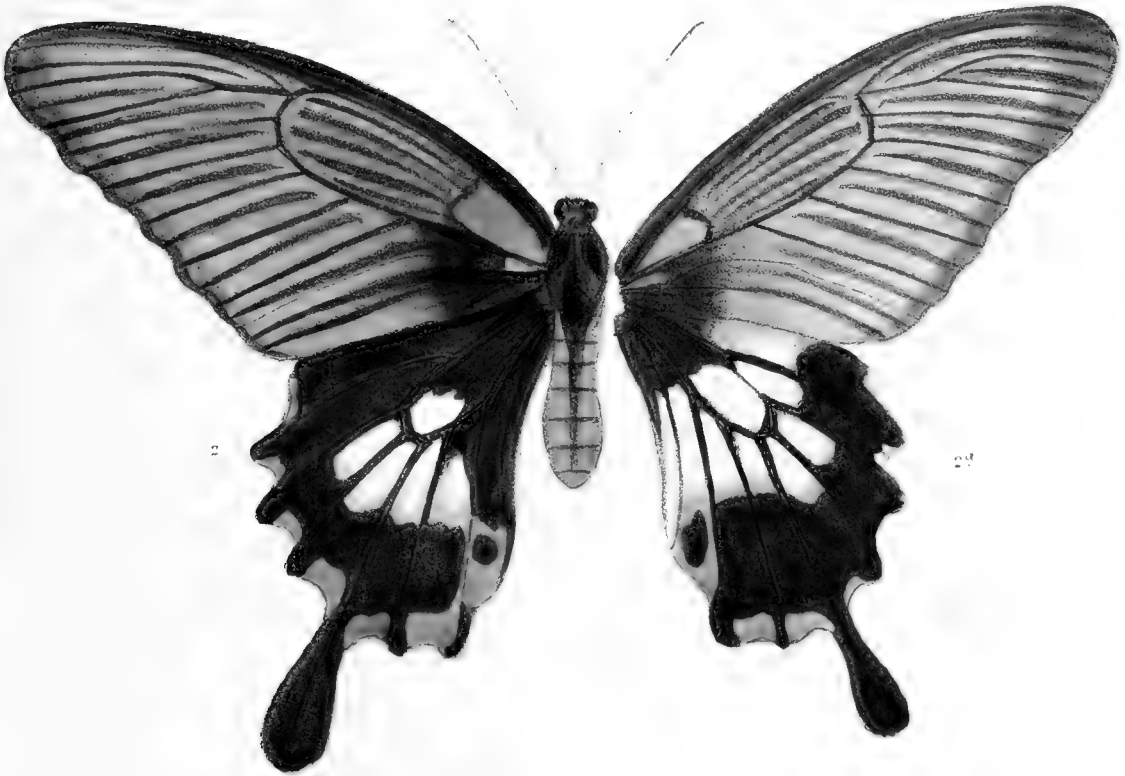








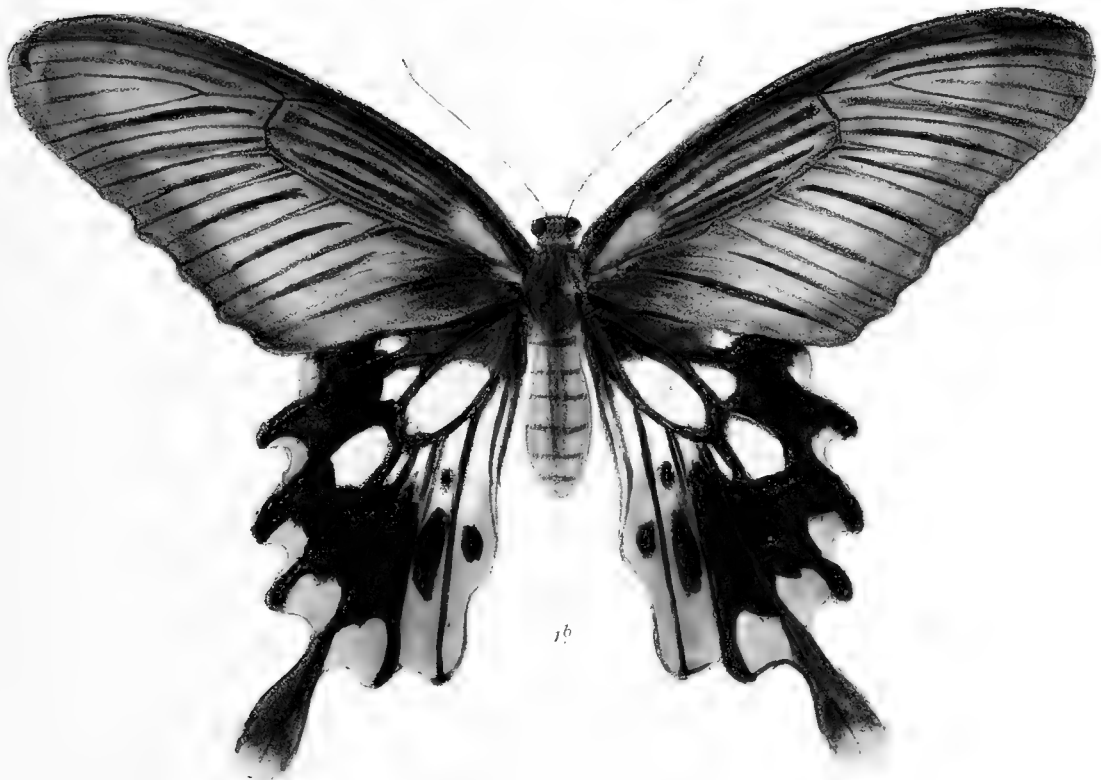
14



13

15

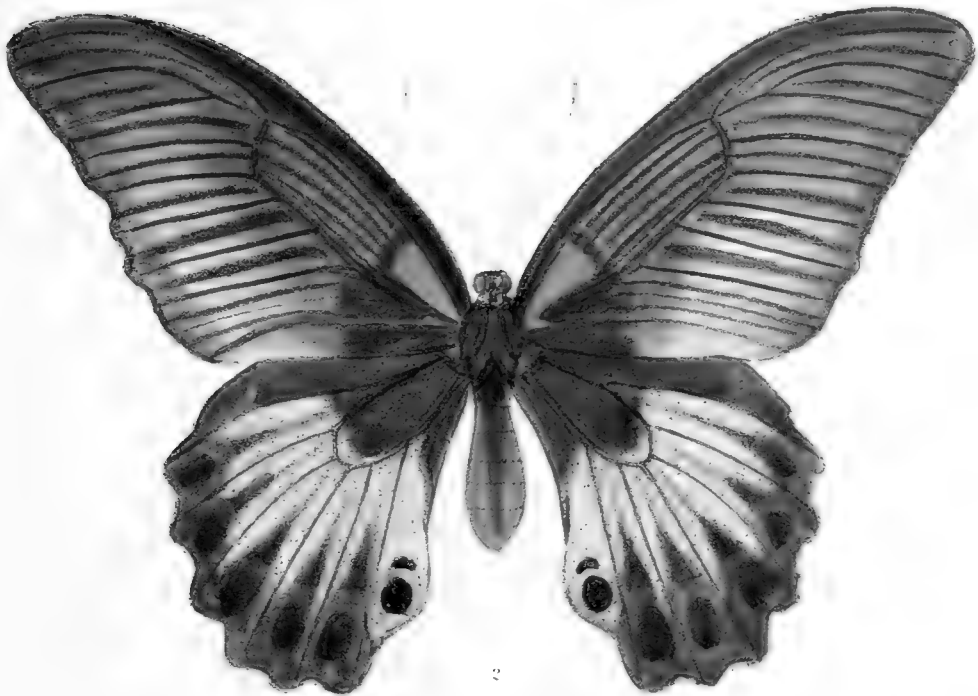




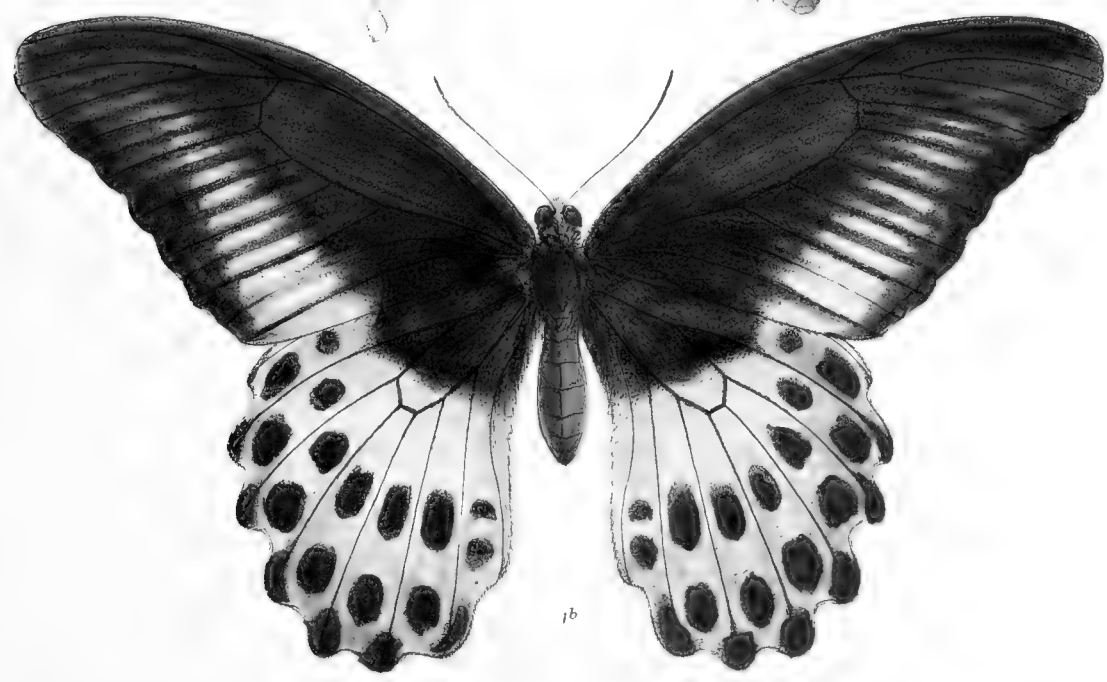
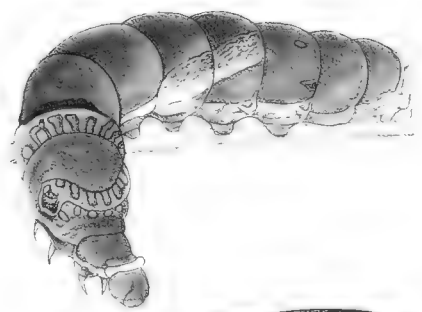
F.C Moore del. et lith.

Harvard University Herbaria



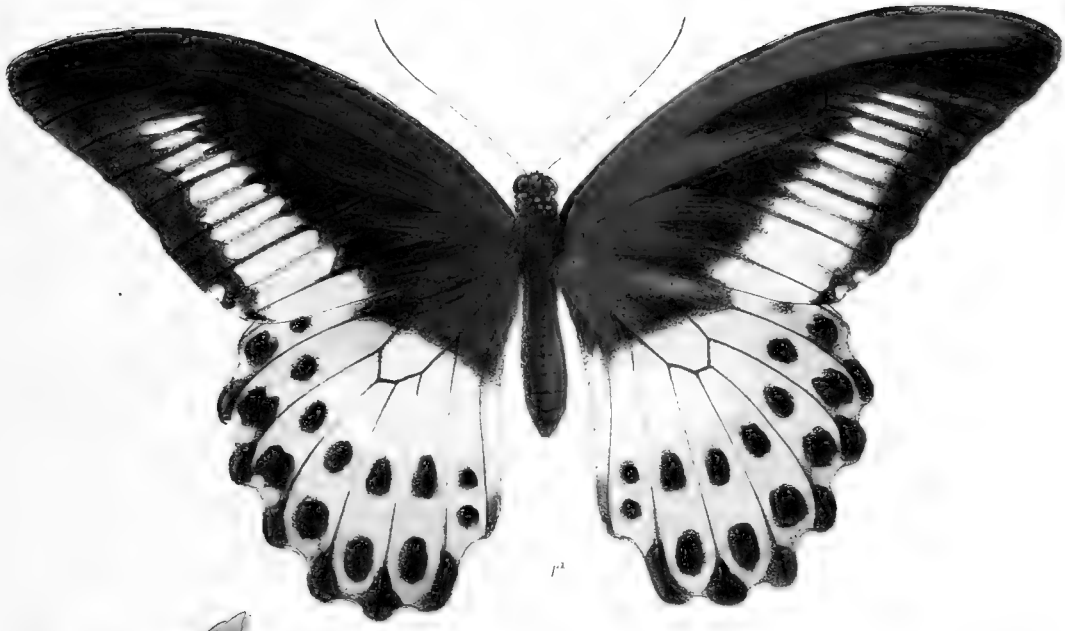












7a



7b

7c





7

10



16



17

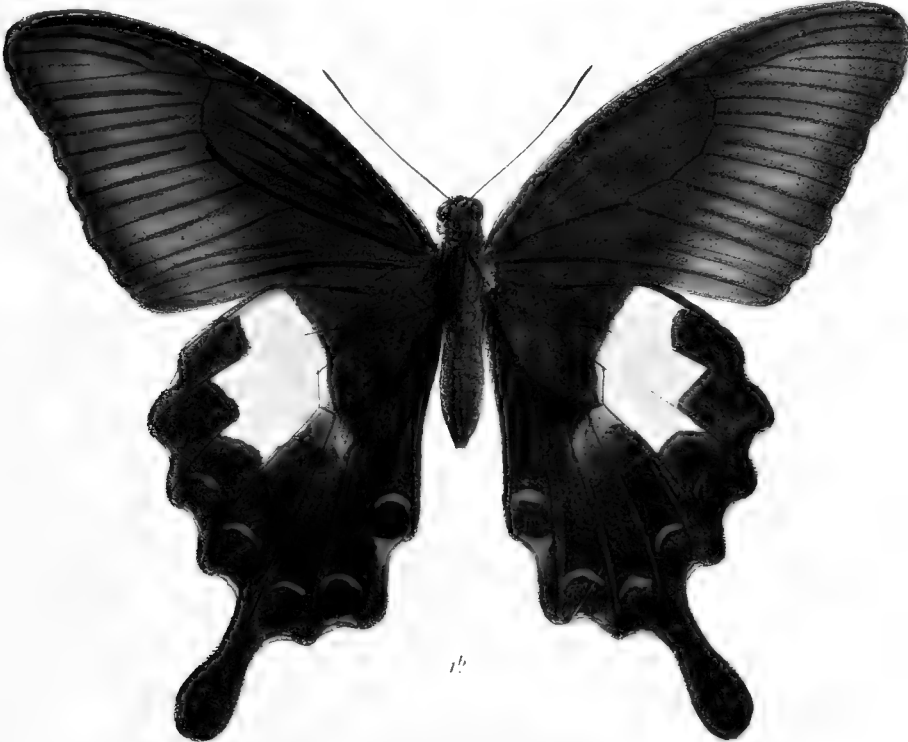
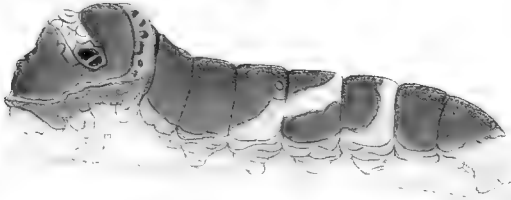




1<sup>a</sup>



1



1<sup>b</sup>











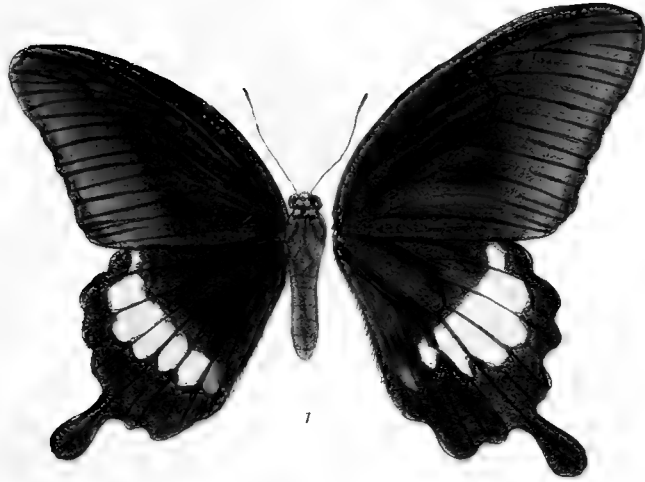




F. M. ...

...





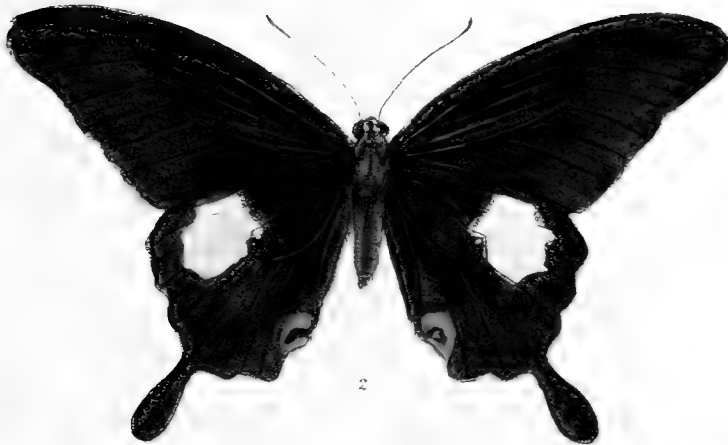
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1<sup>a</sup>

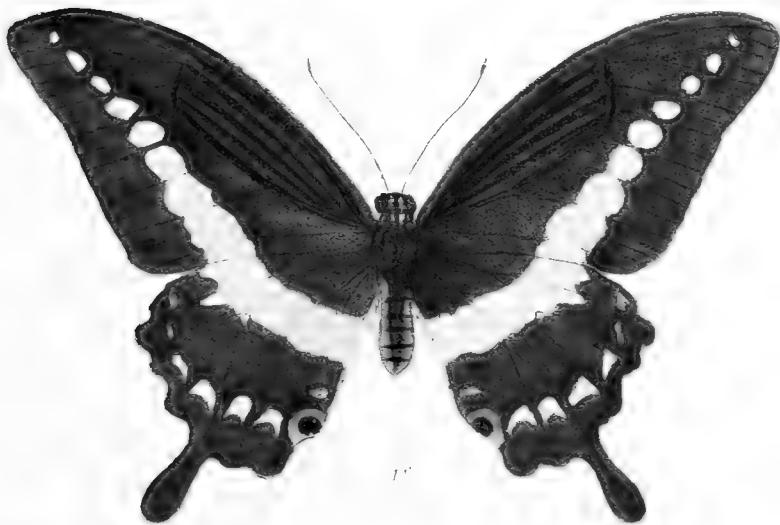
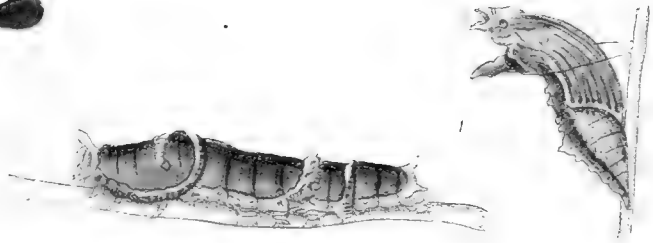
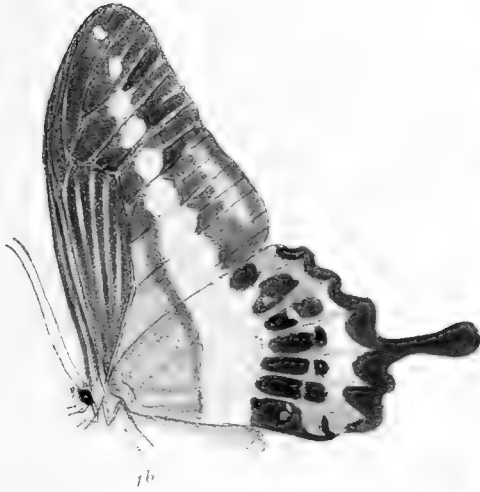
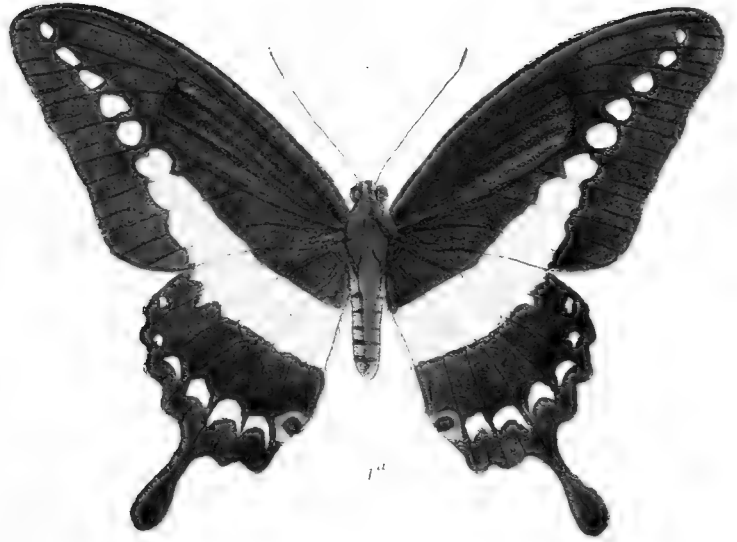


2<sup>a</sup>



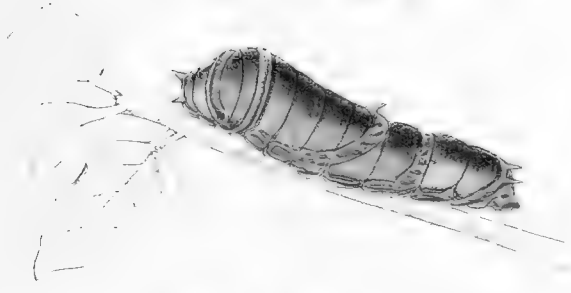
2











J. N. Fitch del. ex. lit.

Edwards & Kellogg sculp.









1

1<sup>a</sup>

1<sup>b</sup>

1<sup>c</sup>



1<sup>d</sup>

1<sup>e</sup>





